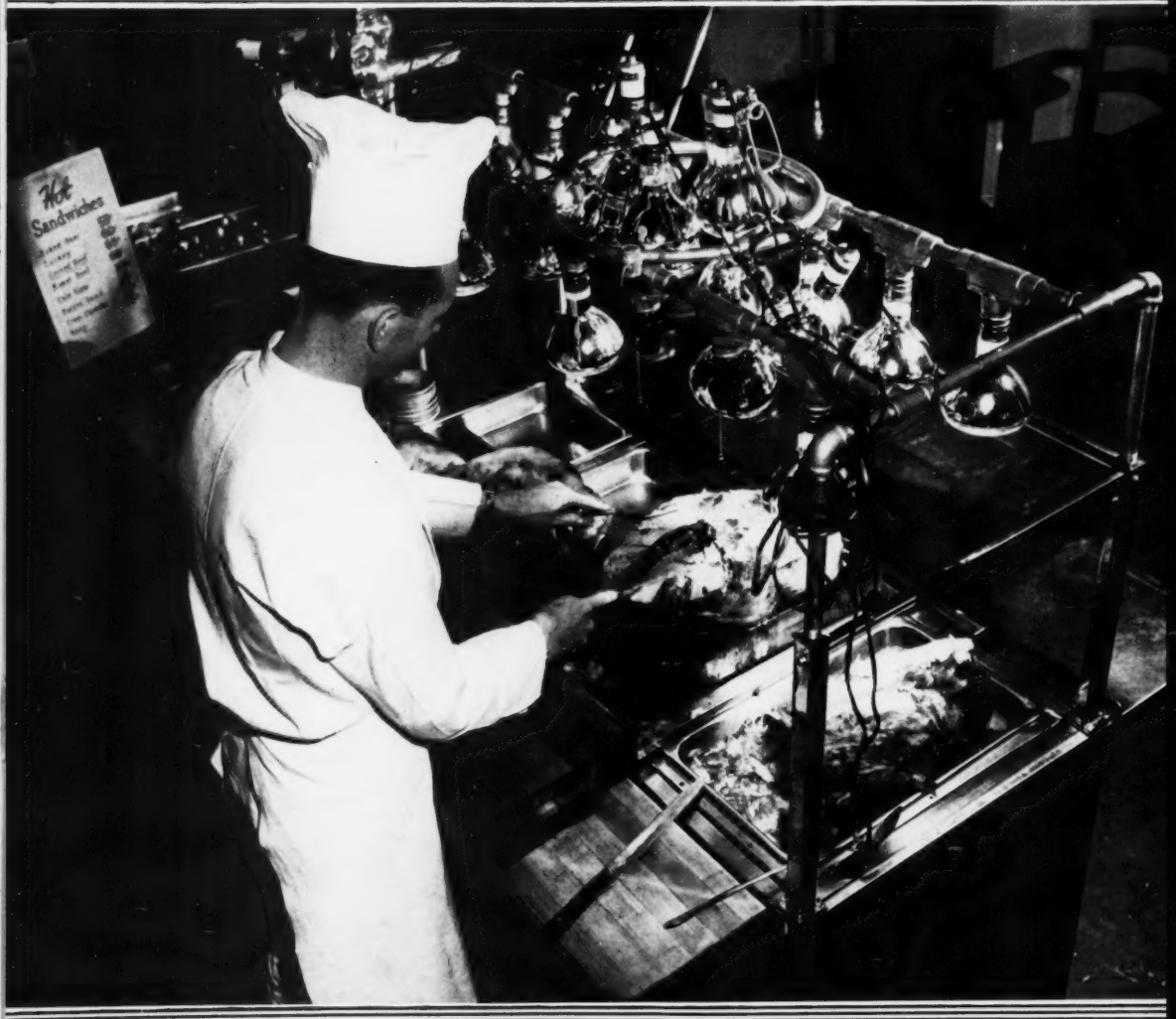
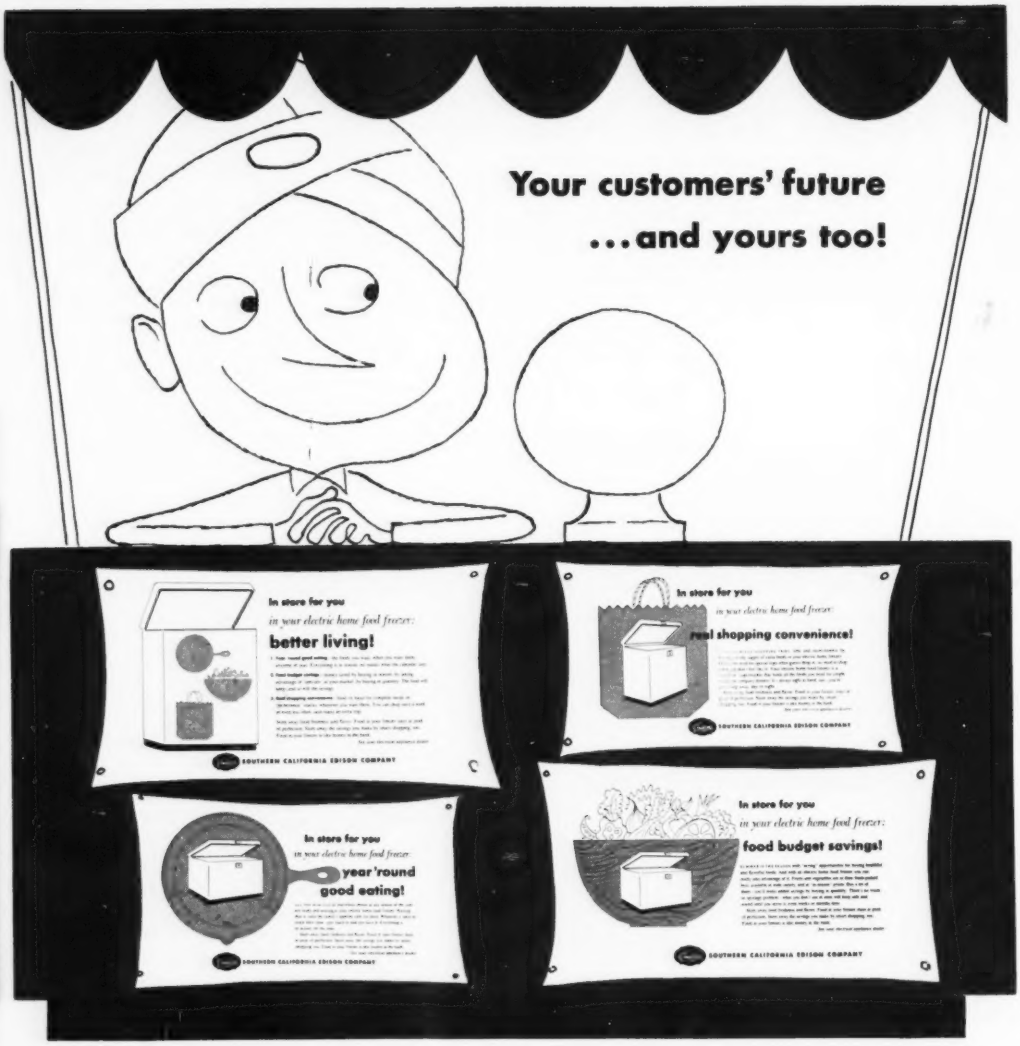
ELECTRICAL WEST

July 1951
25 Cents



Another Controversial Line, Page 55
Appliances, Page 73

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

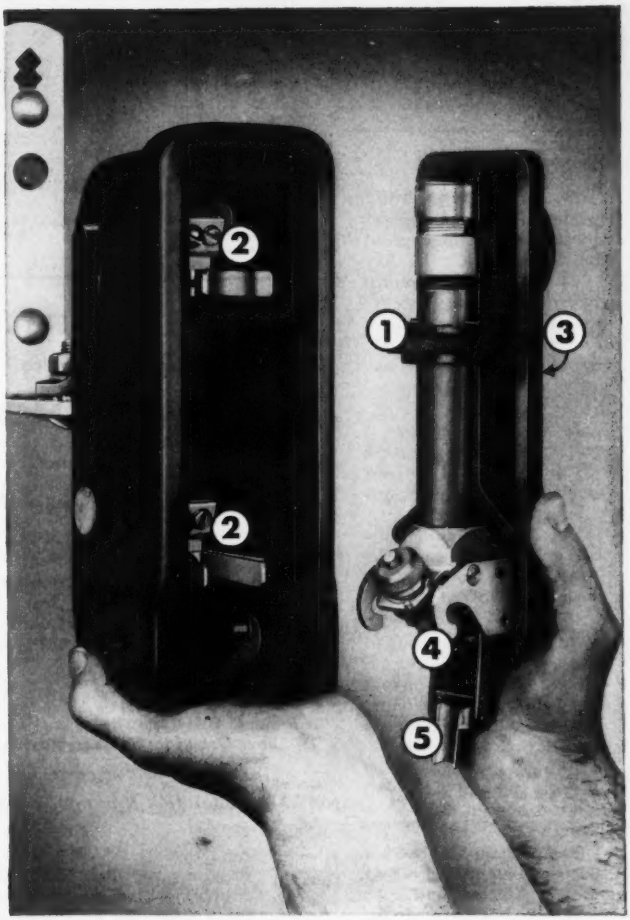


Summer is the season for freezing—the best time of year for buying and stocking up electric home food freezers. That's a fact, by the calendar, and Edison summer advertising is pointing it out to homemakers everywhere in Edison territory.

Clearly, the best time to *buy* home food freezers is also the best time to *sell* them. So these Edison advertisements are painting a brighter future for homemakers and for electrical appliance dealers, at one and the same time. Alert dealers who tie in—will cash in!

SOUTHERN CALIFORNIA EDISON COMPANY

1. **FLASHOVER PREVENTED** by a neoprene-sealed barrier between top and bottom contacts.
2. **REINFORCED CONTACTS** and double-clamp terminals for 2/0 conductor are silver plated.
3. **CLEAR IDENTIFICATION** is assured by white disk monogram on front of door which assists in zoning applications.
4. **RECOIL CUSHIONING** is achieved by springs located between the door and hinge assembly.
5. **POSITIVE INDICATION** of blown fuse is given by a double spring-operated indicator arm.



Lowest-priced 100-ampere fuse cutout for high-capacity feeders

This General Electric 100-ampere heavy-duty fuse cutout gives you:

- One cutout for either 50-ampere or 100-ampere requirements
- Positive full-range operation with any fuse link up to and including its 100-ampere rating
- Reliable interruption up to 8000 amperes at 2.5 kv, 5000 amperes at 5.2 kv

Yet its price is no more than that of its *50-ampere* predecessor.

You'll like the economy and reliability of this G-E cutout for your high-capacity feeders. See your local G-E representative for complete information—or write for Bulletin GEC-704, addressing *General Electric Company, Schenectady 5, New York.*

GENERAL ELECTRIC

406-41

With Factories in Anaheim, Los Angeles, Oakland ,Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities

JULY 1951

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S. The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal," "Journal of Electricity, Power and Gas" and "Journal of Electricity." Contents copyright. Sixty-third year of publication

VOL. 107 NO. 1

ELECTRICAL WEST

George C. Tenney, Editor
W. A. Cyr, Associate Editor — Walter C. Heston, Engineering Editor
Peggy Boyer, Assistant Editor — John Cootz, Typography

Next Month

We are disappointed that we were unable to run the Long Beach steam plant subsidence article in July as promised. Mechanical difficulties made it necessary to hold it over until August but it will definitely appear in that issue. It will be a most interesting article.

For August we have a particularly timely article scheduled on complete conversion to the use of aluminum conductor by the Sacramento Municipal Utility District. There were many problems and all of them are not yet solved.

The three new hydro plants of the Los Angeles Department of Water & Power in Owens Gorge and the new Big Creek 4 plant of the Southern California Edison Co. will be given picture-story treatment by a staff member who will make a special trip to the project.

One of the most spectacular and interesting recent lighting jobs on the Pacific Coast is that in the new multimillion-dollar Capitol Annex at Sacramento. This will be featured in August with a number of pictures to illustrate techniques.

Revision of the California Industrial Safety Orders has finally been completed. There will be an analysis of these important orders pointing out departures from the National Electric Code.

CONTENTS

Another Controversial Transmission Line 55

ENGINEERING

Electrical Features at Arapahoe Plant by Warren D. Hardaway 58
Automatic Tie Line Load Control by C. M. Clevenger and L. E. Ludekens 60
Transmission Line Provides Energy for Aircraft Warning Light 63

LIGHTING AND WIRING

Capitol Annex Uses 480-v Distribution by Clinton S. King 65
Relighting the Denver National Bank 66
Rare, Medium or Well—With Infrared by Arthur H. Greisser 68

SALES

Still Making Sales from It 73
S. D. Show Unfreezes Freezer Prospects 79

ASSOCIATIONS

NWEL&P Groups Talk Men and Fringes 82

DEPARTMENTS

Books	24	New Products	28
Bulletins	50	News	92
Contractors' News Letter	71	Northwest Data Sheet	70
Editorials	80	Sales Guide News Letter	75
Electra's Husband	52	Advertising Index	110

Cover: Infrared heat food table at Ireland's Mart in Portland. See story page 68.

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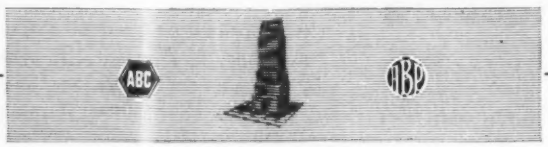
San Francisco (4) ..... Tom Carmody, 68 Post St., DO. 2-4600



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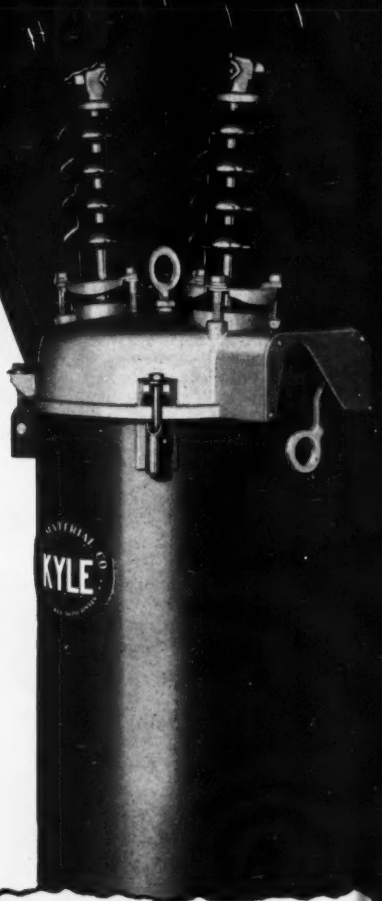
KYLE



TYPE "L" OIL CIRCUIT RECLOSER NOW GIVES YOU UP TO

6000 amps interrupting capacity

IN NEW 140-AMP RATING

First recloser actually engineered for heavy-duty service . . . full power-class design . . . 110 kv insulation impulse level . . . ratings up to 140 amps . . . only real heavy-duty recloser in its class

Kyle type "L" reclosers cost a little more than lighter-duty reclosers, but they're worth the difference in service, performance, convenience, and freedom from maintenance. Even if you don't need the extra interrupting capacity now, you will need it to take care of future loads; and in the meantime you enjoy all the benefits of type "L" performance and economy.

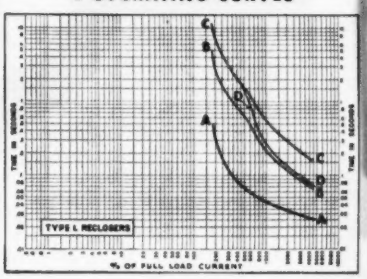
It's the Kyle oil cross-blast method of arc extinguishing, plus heavy-duty design, that makes it possible for the "L" to handle heavy fault currents up to 6000 amps.

The type "L" is the only recloser with so wide a choice of operating sequences. Four standard curves permit any sequence of operation to meet your coordination problems.

Sequence and coil changes are made right in the field—in a few minutes. To change to a coil of different rating, you just remove two screws. To change operating sequence, simply rotate a disc or change one small part. It's quick—and easy! Saves shop trips!

Extremely accurate; virtually no effect from ambient temperature changes. Positive fast operation; positive toggle closing—doesn't depend on gravity. Many safety features: cover and tank electrically dead—bushing tops only live parts; trip-free operating handle. Large sleet hood protects counter and operating handle; may be rotated in 90° steps. Rugged; shock-proof; trouble-free.

ONLY RECLOSER WITH 4 OPERATING CURVES



RATINGS

Coil Rating Amperes	Min. Trip Current Amperes	Maximum Interrupting Capacity Amperes At Maximum Phase-to-Phase Nominal Voltage of		
		4.8 kv	7.2 kv	14.4 kv
25	50	1500	1500	1500
35	70	2100	2100	2100
50	100	3000	3000	3000
70	140	4200	4000	3000
100	200	5000	4000	3000
140	280	6000	4000	3000

Read all about it!

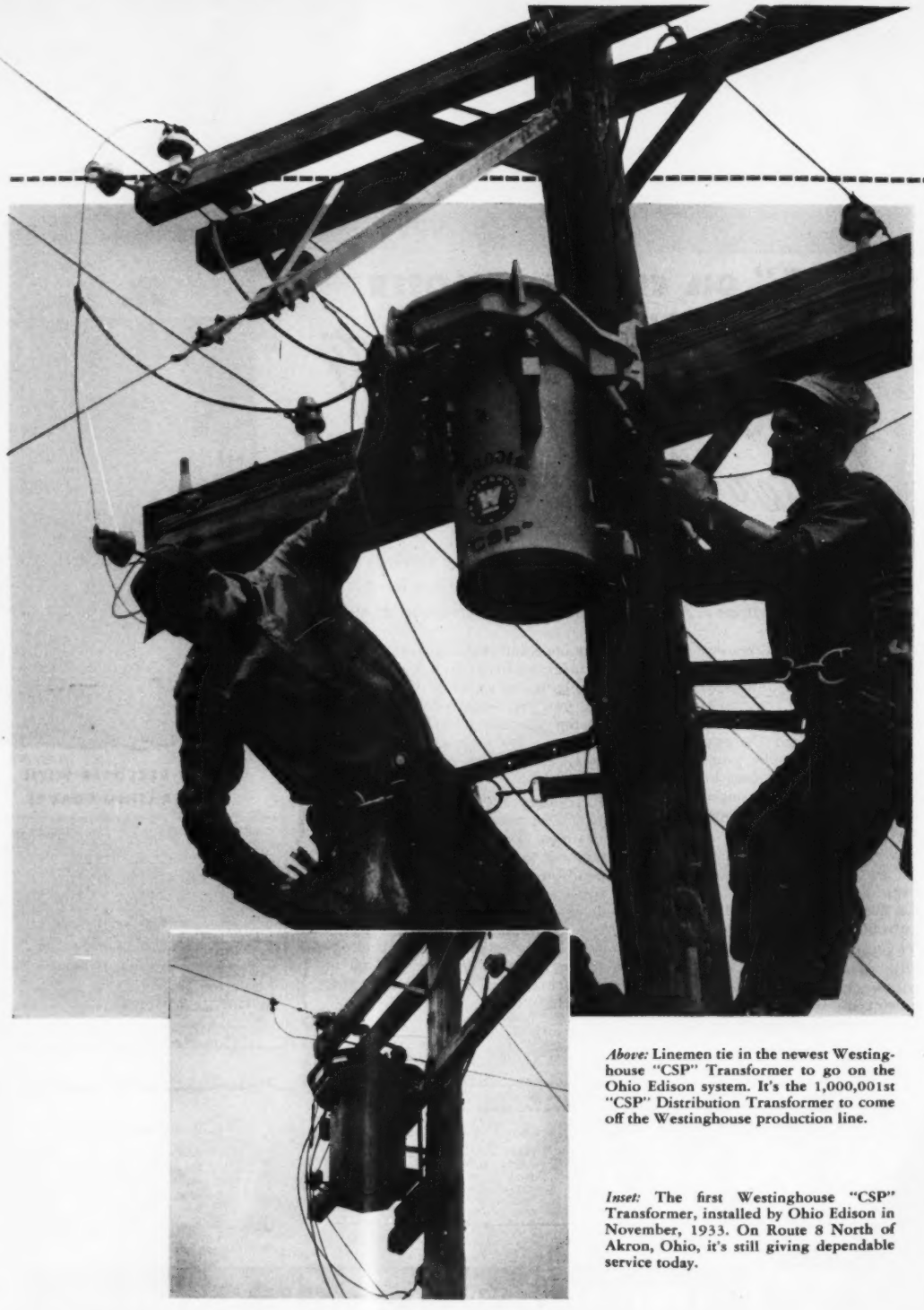
Ask the L-M Field Engineer for a copy of Bulletin CR1A—on the type "L"; or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

18

LM

LINE MATERIAL... Kyle Reclosers

Complete Coordinated Equipment for Distribution Today



Above: Linemen tie in the newest Westinghouse "CSP" Transformer to go on the Ohio Edison system. It's the 1,000,001st "CSP" Distribution Transformer to come off the Westinghouse production line.

Inset: The first Westinghouse "CSP" Transformer, installed by Ohio Edison in November, 1933. On Route 8 North of Akron, Ohio, it's still giving dependable service today.

YOU CAN BE **SURE**.. IF IT'S
Westinghouse

SEVENTEEN YEARS

Proof enough for one customer

Back in 1933, Westinghouse delivered the first of a new type of distribution transformer to Ohio Edison . . . the "CSP" (Completely Self-Protecting) Transformer. Today, seventeen years later, it's still in service. For a "CSP" Transformer, this record is not unusual.

Ohio Edison has standardized on the completely self-protecting type of transformer and in line with this policy, Westinghouse "CSP" number 1,000,001 has been installed on the Ohio Edison System.

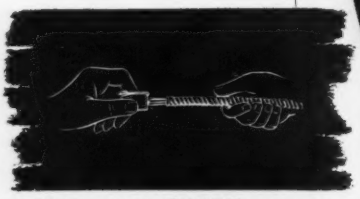
Such performance establishes beyond doubt that "CSP" Transformers offer long-range dependability plus savings in operating costs. It's easy for you to prove for yourself that "CSP" Transformers, with both thermal and lightning protection built in, can cut distribution costs for you . . . are economical to install . . . inexpensive to maintain. Ask your Westinghouse representative for a copy of B-4247B, "TRANSFORMER COSTS . . . and their relation to PROFITS". Or write Westinghouse Electric Corporation, 410 Bush Street, San Francisco 8, Calif.

J-70567

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.

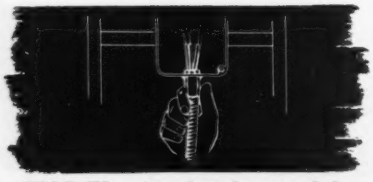
SnapX

It's New!
It's Different!
It's Easier to use!



INSERT cable in SNAPX connector.

COMPRESS spring clip that holds cable.

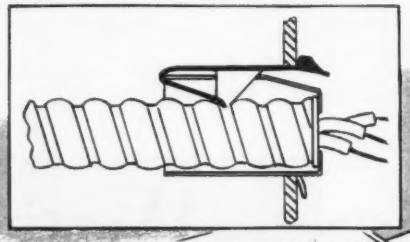


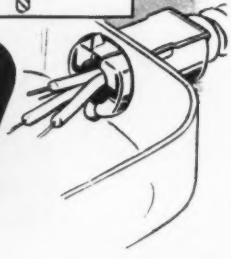
SNAP IN to box knockout and the cable is set — the job done!

The Entirely New Connectors For Armored and Non-Metallic Cable That You Just Snap Into Place!

SNAPX is the new cable connector that is installed without tools. There are no nuts or screws to tighten. Just compress, snap it in place and it's set.

To try it is to buy it. See how easy SNAPX is to use! Write today for your free sample, giving the name and address of your electrical wholesaler.





BRIEGEL METHOD TOOL CO.
GALVA, • ILLINOIS

SnapX Fittings for 2-12 and 3-12, 2-14 and 3-14 armored, and 3-12 and 3-14 non-metallic cable carry the underwriters seal of approval.

Now over 96,000 HOURS of trouble-free turbine lubrication with SHELL TURBO OIL

88,000 HOURS
of trouble-free turbine lubrication
with SHELL TU O
And at last inspection the oil was still in "like new" condition... reports a well-known power company
TYPICAL APPLICATIONS
Where Shell Turbo Oils Can Save on Long Term Lubrication Costs
STEAM TURBINES—Direct connected, geared, pressure circulation, ring oiled
HYDRAULIC TURBINES—Vertical, horizontal, in governor system, thrust and guide bearings
HYDRAULIC SYSTEMS—In machine tools, hydraulic presses and other oil-hydraulic power equipment
BEARINGS—Plain and anti friction—where severe conditions or other factors point toward use of oxidation resistant oil.
Also recommended for extra heavy duty air compressor lubrication
Only an oil with these extra qualities can give such performance

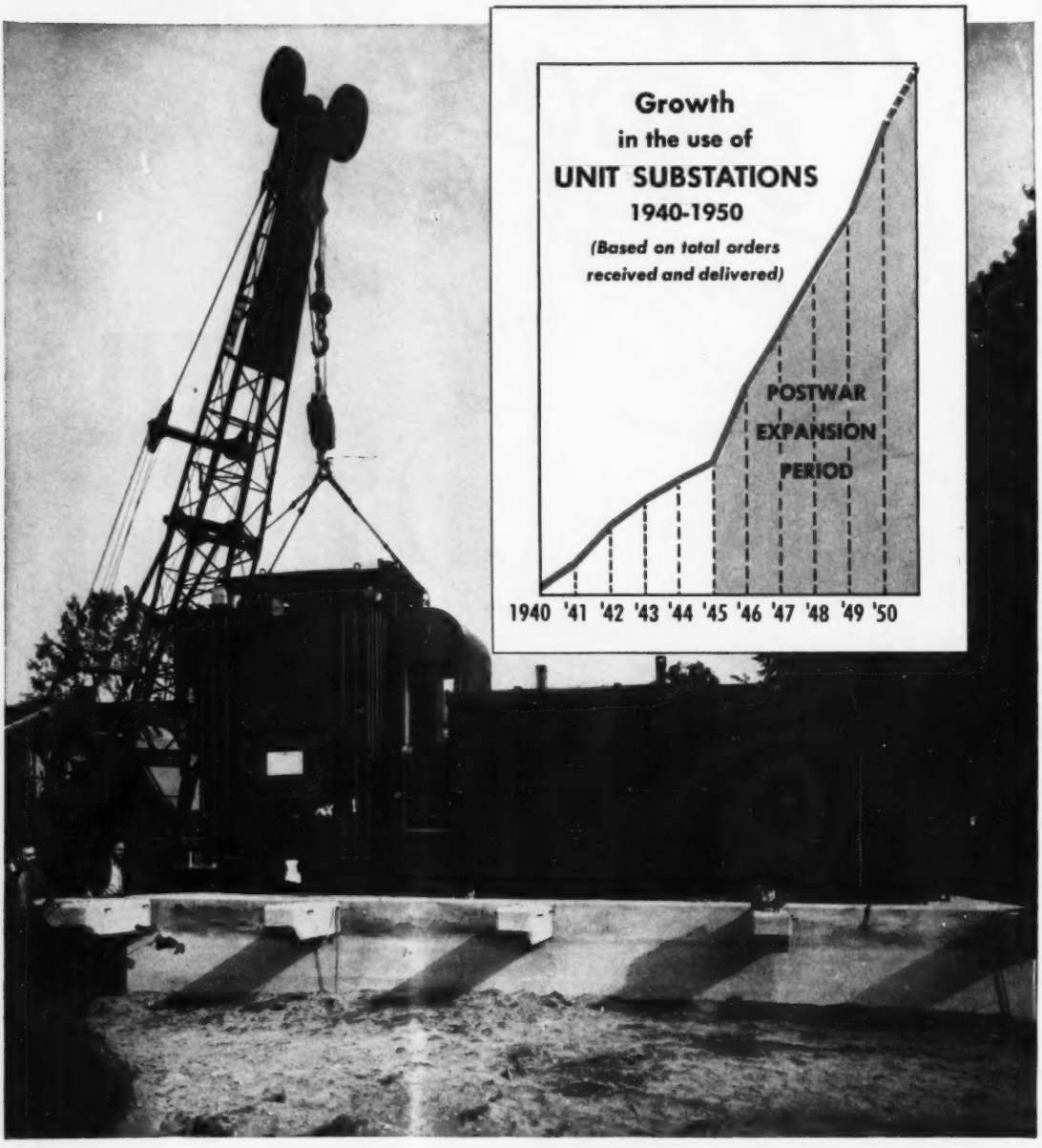
ONE YEAR AGO Shell published the advertisement at left. It reported a remarkable case history about Shell Turbo Oil: 88,000 hours of service in a power company turbine...trouble-free turbine lubrication the whole time...the oil itself still in like-new condition.

This year adds another chapter. Now—the same charge of Shell Turbo Oil has gone more than 96,000 hours. The company has enjoyed another year of trouble-free turbine lubrication. And the oil is STILL in like-new condition.

No matter what type of turbine you operate...steam or hydro, stationary or marine, in power generation or mechanical drive...you can count on long, trouble-free lubrication with Shell Turbo Oil. *Money-saving lubrication.*

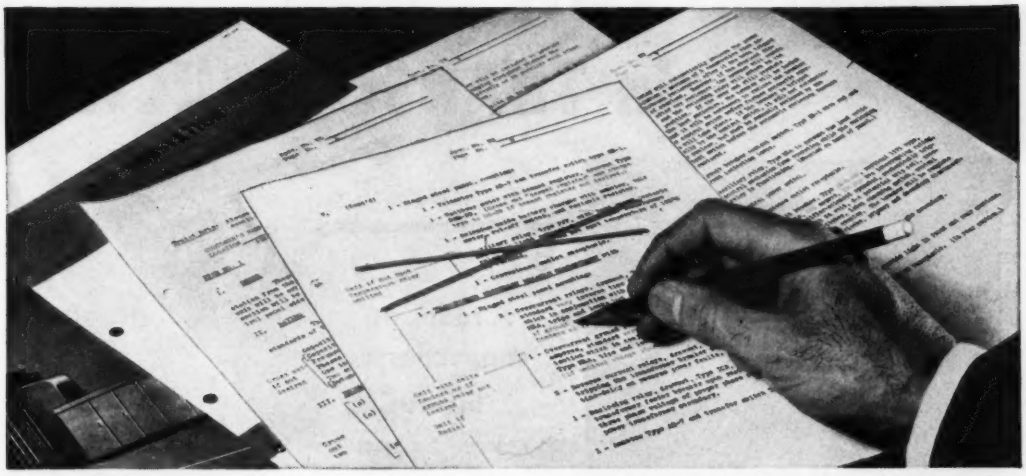
SHELL

Unit Substations—Key to



QUICK INSTALLATION: G-E unit substations come to you complete—ready for operation. You merely build the foundations, position the equipment and connect to your incoming and outgoing lines. Photo shows G-E unit substation being installed on the system of the Western Massachusetts Electric Co.

Fast, Low-cost Expansion



Simplified purchasing, ease of installation help in meeting fast-growing loads . . .

The rapid trend to factory-assembled unit substations—as shown in the chart at the left—seems sure to accelerate even more tomorrow.

Faced with the fastest-growing loads in history, utilities are finding these standardized, easy-to-install units one of their most valued tools in meeting expanding power demands quickly and at lowest cost.

Because of their great flexibility, compactness and adaptability, G-E unit substations are applicable to a wide variety of system arrangements. Standard, co-ordinated designs simplify planning and purchasing.

There's less worry about manpower and material problems. And proved, factory-engineered construction assures outstanding dependability. For full information, write for Bulletins GEA-3800 and GEA-4500. *General Electric Co., Schenectady 5, N. Y.*

WEEKS SAVED IN ORDERING! Basic guide-form specifications for G-E unit substations are available to you, and using these, you merely add ratings and number of circuits required and cross out details not applicable. Weeks are saved in detailing layouts and piecemeal ordering. Your engineers have more time for other system work.

INSTALLED RIGHT AT LOAD: Compact, modern, attractive design of G-E unit substation enables it to be installed close to the load, even in many residential areas. Vital copper for secondary circuits is saved. The substation above was installed by the Western Massachusetts Electric Co. Note church in background.

321-74

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

Cables run COOLER...
in TRANSITE DUCTS

. . . reducing copper losses

. . . increasing current capacity

. . . prolonging insulation life

HERE'S HOW to reduce copper losses . . . increase current carrying capacity . . . and prolong insulation life—run your cables in Transite* Ducts.

Current carrying capacities can be increased in a typical duct bank as much as 5%, or I^2R losses can be reduced 11%, for cables located in Transite as compared with other ducts used for power circuits.

And, Transite Ducts assure permanent duct banks because Transite is incombustible; is immune to rust and rot; is unaffected by electrolysis; will not slag under action of an arc, and will retain its high original strength.

An unusually smooth bore assures no injury to cable sheath, either in natural movement under load, or when pulling-in cables. Long, lightweight lengths can be quickly and economically installed. In addition, a full line of fittings simplifies even the most complicated of installations.

For full information on Transite Ducts, write for Data Book DS-410. Johns-Manville, Box 290, New York 16, N. Y.

*Reg. U. S. Pat. Off.

How Transite Ducts increase current carrying capacities

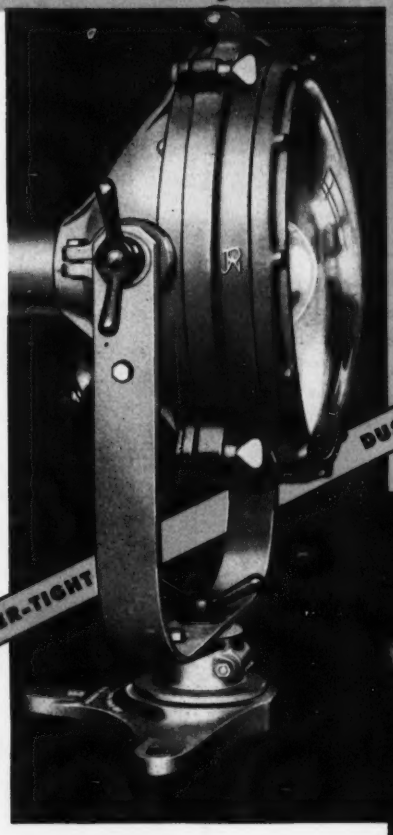
Type cable 3 cdr. 500 MCM Compack Sector, 15 KV (6th Edition AEIC Spec.)
No. of cables—3 (all loaded in one bank)
Daily Load Factor—75%
Earth Temp. ambient—20 C

	Transite	Other
Total Therm. Res. to Dielectric Loss (C watts/ft.)	5.66	6.17
Total Therm. Res. to Copper Loss (C watts/ft.)	4.44	4.95
Temp. Rise from Dielectric Loss (C)	1.9	2.1
Allowable Rise for Copper Loss (C)	59.1	58.9
Allowable Watts per ft. cable	4.44	3.96
Allowable Current—(Amps. per cdr.)	386.	365.
Allowable Current—(Relative %)	105.6	100.

Johns-Manville *Transite Ducts* "KORDUCT"—for encasement in concrete

"CONDUIT"—for use exposed and underground without encasement

Consider the years ahead!



For PROTECTIVE and PRODUCTIVE lighting

Specify

PYLE-NATIONAL

ENCLOSED FLOODLIGHTS

Oil Refinery, Oklahoma, 1925

Don't economize on the initial cost when planning a floodlight installation. It is the elimination of large maintenance, repair and replacement expense that counts.

Sealed against moisture and dirt, constructed throughout of rugged, corrosion-proof materials, Pyle-National floodlights retain their original high-efficiency output throughout an exceptionally long service life, with negligible maintenance and replacement expense.

The earliest Pyle-National floodlighting installations are still operating in excellent condition, with ***over a quarter of a century*** of efficient, economical service to their credit! Convincing proof of the value of quality, enclosed floodlights.

Write for catalog 2100, which gives a complete description of our extensive line of heavy duty floodlights.

The services of our experienced floodlighting specialists are available at all times to advise and assist in installation problems.

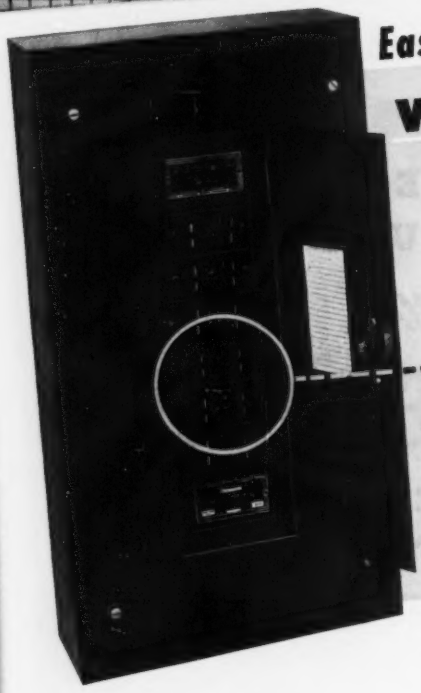
THE PYLE-NATIONAL COMPANY

1364 NORTH KOSTNER AVENUE, CHICAGO 51, ILLINOIS

District Offices and Representatives in Principal Cities of the United States
Export Department: International Railways Supply Co., 30 Church St., New York.
Canadian Agent: The Holden Co., Ltd., Montreal.

SINCE 1897

CONDUIT FITTINGS • PLUGS AND RECEPTACLES • TURBO-GENERATORS • GYRALITES • MULTI-VENT AIR DISTRIBUTION



Easy to Add or Change Circuits

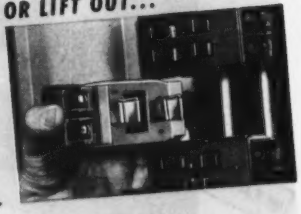
WITH THIS NMO

"PLUG-IN" PANELBOARD

a "Natural" wherever a large number of branch circuits for lights, appliances and business machines must be switched and protected

1 SWING OUT...

2 OR LIFT OUT...



3 ATTACH WIRES...

4 "PLUG-IN"

Flexibility Four-circuit Multi-breaker units have "Plug-in" feature. Any combination of 15, 20, 30, 40, or 50 ampere circuits available. Dummy units can be inserted to anticipate future requirements. ***Easy to Wire***—Multi-breaker units can be swung or lifted out to attach wires. Approved connector eliminates "looping." ***Smaller Size***—Compact Multi-breaker unit permits more circuits and larger wiring gutters without increase in overall panel size. Better utilization of wall and column space.

THERMAL-*Coilless*-MAGNETIC BREAKER UNITS GIVE 2-WAY PROTECTION

Thermal Element responds to heating effects of both load current and surrounding atmosphere. Total temperature is limited to a safe value. ***Magnetic Element*** responds instantly to heavy overloads or shorts.

BOTH Elements are needed for COMPLETE Protection!

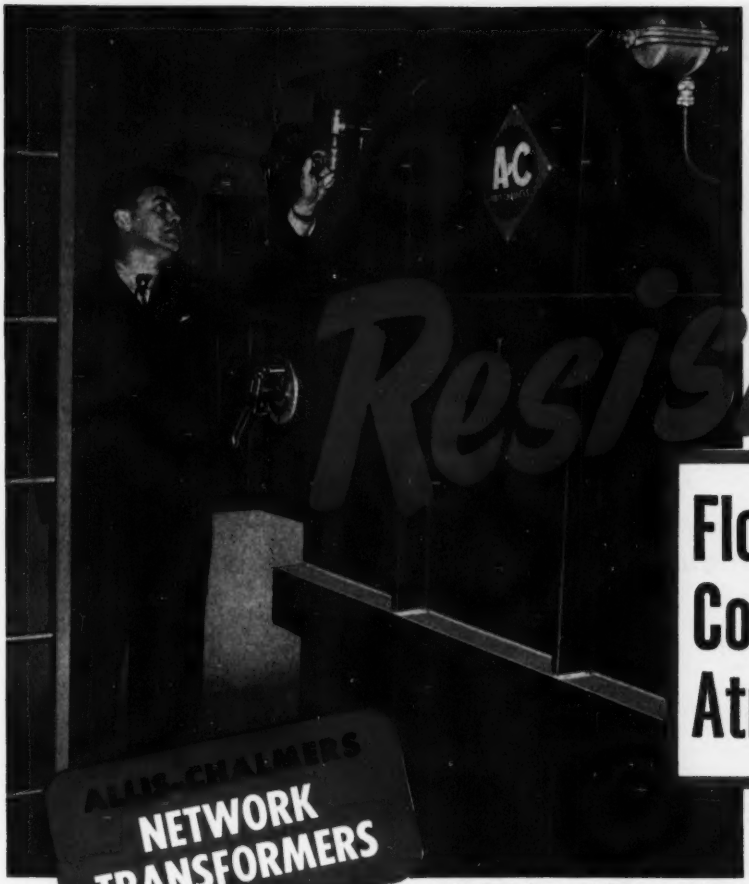
Illustrated NMO Bulletin SA567R gives complete information on the new Panelboards. Address Square D Company, 4335 Valley Boulevard, Los Angeles 32, California.

ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY

DETROIT · MILWAUKEE · LOS ANGELES

SQUARE D COMPANY CANADA LTD., TORONTO • SQUARE D de MEXICO, S.A., MEXICO CITY, D.F.



This submersible sealed dry type transformer operates with complete safety anywhere. Class H silicone insulation, 160° C rise.

Resists...

Floods and Corrosive Atmospheres

IN MAJOR ELECTRICAL systems coast to coast the A-C trademark on network transformers is a familiar sight. Wide acceptance of these transformers is no accident.

Acceptance is based on time proven construction details: circular coil design, outside core clamping, sturdy turn-to-turn insulation. Transformers are built to withstand heavy short circuit stresses. Their thermal capacity is high under the most severe load conditions.

Strongly constructed tanks withstand corrosive atmospheres and even complete submersion in areas where flooding is frequent. Undercoating compound protects surfaces most subject to corrosion. All surfaces are shot blasted and then given 3 coats of baked on paint. Main cover is welded to tank and eliminates large gasket.

SELECT FROM BASIC TYPES

Allis-Chalmers supplies all 3 basic types of network transformers: oil-filled, *Chlorextol* liquid filled or new sealed dry type. It's easy to select the right network transformer for the right job because Allis-Chalmers provides dimensions, ratings and qualified engineering service.

Call in your A-C representative early in your network planning. Get his unbiased recommendations on the best network transformer for your system. For more facts on network transformers write Allis-Chalmers, Milwaukee 1, Wis. for bulletin 61B6152A.

CHLOREXTOL is an Allis-Chalmers trademark. A-3378

OIL FILLED. Widely used because of over all economy and proved dependability. High in efficiency and reserve thermal capacity. Vault or subway types.

CHLOREXTOL LIQUID FILLED. Chlorextol liquid eliminates fire and explosion hazards. For use where safety codes require extra safety. Vault or subway types.

NEW SEALED DRY TYPE. Thanks to class H insulation no coolant necessary. Requires no internal maintenance. Eliminates fire and explosion hazards. Hermetically sealed.

ALLIS-CHALMERS

Build LINE SECURITY *with* CHANCE ANCHORS

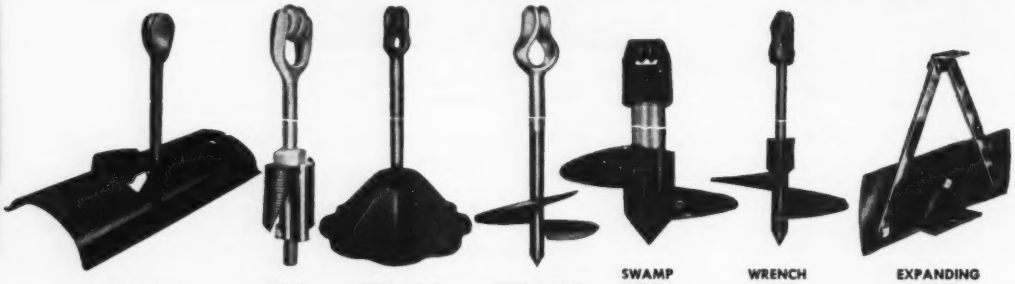
. . . the Steel 8-WAY Expanding Anchor holds all the way around. More Anchor for Less Money.

This anchor expands to form a cone-shaped square with *no wasted area between blades.* The load is carried by eight rib-reinforced blades that fit together closely. Compare the 8-Way with any expanded two, three or four way anchors and you'll understand one reason why this anchor outsells all others.

Another important reason for the popularity of the 8-Way is the simple construction that makes it light in weight—easy to handle, install and expand, and makes it less expensive than other expanding anchors. Available in 6″, 8″, and 10″ diameters with 70 to 200 square inch expanded areas.

. . . the CROSS-PLATE Anchor installs in vertical or angled machine-bored holes. Cuts costs.

New transmission lines in the Western states are being guyed with the Chance Cross-Plate Anchor, designed for installation in machine-bored holes. This anchor consists of two pieces of heavy steel with reinforcing ribs and flanges, welded together, with a nut retainer riveted on the bottom to aid installation. Several Cross-Plates can be carried in the space required for one dead-man anchor. They are lighter in weight, easier to handle, and less expensive to install. Available in 13″ and 16½″ plate sizes. Dipped in corrosion-resistant asphalt paint.



NEVER-CREEP | ROCK | STEEL CONE | STEEL SCREW | SWAMP SCREW | WRENCH SCREW | EXPANDING POLE KEY

There's a CHANCE ANCHOR for every kind of guying job!

A complete stock of Chance products is carried in all GESCO offices and warehouses in the Pacific Coast territory. They are among the many famous name brands carried by General Electric Supply Corporation, assuring you the finest materials obtainable.

GENERAL ELECTRIC
SUPPLY CORPORATION

SAN FRANCISCO • OAKLAND • SACRAMENTO • FRESNO • LOS ANGELES
SAN DIEGO • PHOENIX • SEATTLE • PORTLAND • TACOMA • SPOKANE

Shooting for low-cost installation?

Secondary feeders for softball field lights—7,000 ft. of 300,000 cm aluminum cable, neolay insulated, buried direct. Voltage drop held to less than 2% on 220/110-volt circuits. (Runs up to 375 ft.)

figure it in aluminum

You can't miss seeing the saving when you figure wiring in aluminum. For distribution lines, power and feeder cable, for industrial wiring—insulated aluminum electrical conductors cost less to buy, less to install. The bigger the cable, the greater your saving. For names of manufacturers, call your nearby Alcoa sales office (look under "aluminum" in your classified telephone directory). ALUMINUM COMPANY OF AMERICA, 1777G Gulf Bldg., Pittsburgh 19, Pennsylvania.

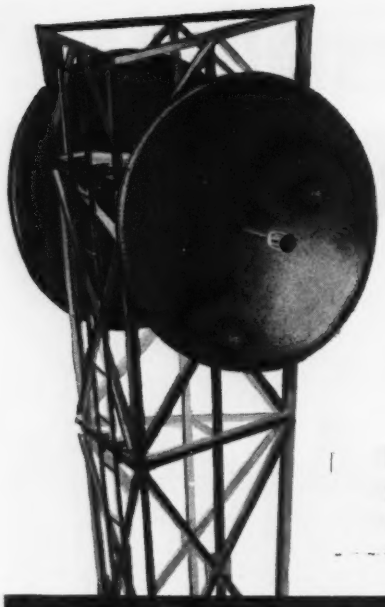
• • •

Although the rearmament program prevents unrestricted sale of aluminum, we are ready to help you with the planning required for electrical wiring projects. Get the facts! Write for "Questions & Answers About Aluminum Conductors and Installations".

Insulated **Aluminum Conductors**

ALCOA ALUMINUM ®

of ALCOA EC ALUMINUM are made by leading manufacturers



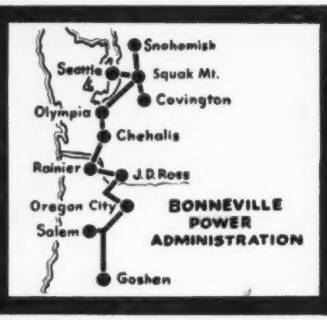
Federal
PTM MICROWAVE

Provides Complete Communications For Power Utilities . . . plus

Centralized Operation!

INSTANTANEOUS, CONTINUOUS SERVICE

Federal has the system that offers the most positive basic channels for telephone, telemetering and remote control circuits . . . with tie-in of all mobile radio units.



PROOF OF PERFORMANCE!

These four great utilities have selected Federal Pulse-Time Modulation Microwave—the first system to serve a power utility. Two have recently re-ordered.

Detroit-Edison's efficiently-operating system will install extra channels and a 42-mile extension . . . Bonneville Power Administration's present successful system will be extended 128 route miles.

Here is gilt-edged proof of the reliability, continuity and quality service provided by all-purpose, all-weather PTM systems engineered by Federal . . . pioneer in modern microwave techniques . . . world leader in systems of simplest design, highest power and lowest maintenance.

Write, wire or telephone today for complete, up-to-the-minute proof-of-performance information on Federal PTM Microwave. Address: Wire and Radio Transmission Systems Division, Dept. F-4103

FEDERAL TELECOMMUNICATION LABORATORIES, Nutley, N. J. . . . . a unit of IT&T's world-wide research and engineering organization.

Federal Telephone and Radio Corporation

100 KINGSLAND ROAD, CLIFTON, NEW JERSEY

In Canada: Federal Electric Manufacturing Company, Ltd., Montreal, P. Q.
Export Distributors: International Standard Electric Corp., 67 Broad St., N.Y.

OVERLOAD PROTECTION

FOR SMALL MOTORS

COMPLY WITH THE NATIONAL ELECTRICAL CODE

by using the Approved Bulletin 600 Starting Switch

Toggle lever switch with cover removed

Key operated for public places

For hazardous gases

For waterproof service

It looks like an ordinary snap switch . . . but something has been added . . . a self-contained thermal overload breaker. The heater element quickly detects an overload on the motor. It releases a soldered ratchet . . . the contacts snap open, automatically.

The motor is thereby disconnected before a burnout can occur . . . and it cannot restart until the toggle lever is flipped down manually to reset the overload breaker. If the overload persists, the contacts cannot be held closed by the operator.

This compact starter, rated at 1 hp, 110-220 v, is a favorite with engineers who want a small, inexpensive switch to protect fractional horsepower motors. Send for Bulletin 600.

Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wisconsin

5-51-MR

A-B Quality

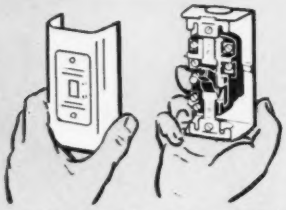
ALLEN-BRADLEY

BULLETIN 600 STARTING SWITCHES

QUALITY

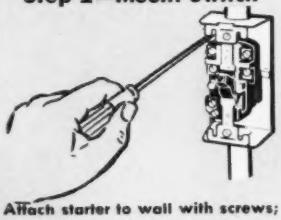
So Easy to Install ... So Dependable in Service

Step 1—Remove Cover

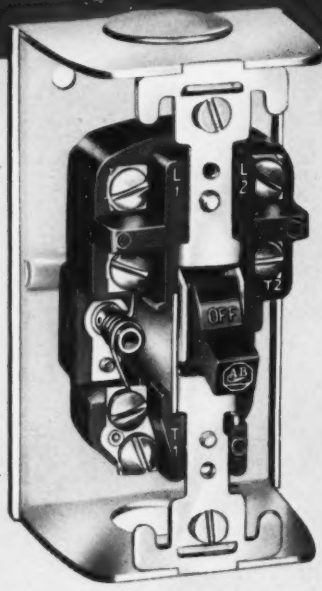


Simply remove two screws; metal cover then slips off easily, exposing the Bulletin 600 starter terminals.

Step 2—Mount Switch

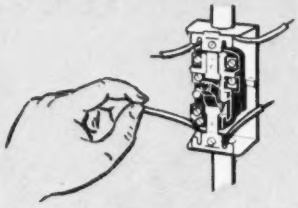


Attach starter to wall with screws; convenient conduit openings are located in the top, bottom, and back.



Bulletin 600—the ideal switch for starting and protecting small motors on unit heaters, stokers, fans, pumps, refrigerating compressors, grinders, and small machine tools.

Step 3—Wire and Connect



Line and motor wires can be easily pulled into the box without removing the starter from its enclosure.

Step 4—Replace Cover

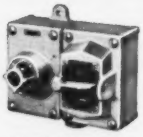
Cover is slipped on and secured with two screws. The Bulletin 600 installation is always quick and easy.

BULLETIN 600 MANUAL STARTING SWITCH for SMALL MOTORS

Two starters in one enclosure

Starter with selector switch

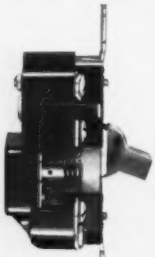
Starter with pilot light



Watertight starter with pilot light

In standard wall box

AVAILABLE IN ENCLOSURES FOR EVERY APPLICATION



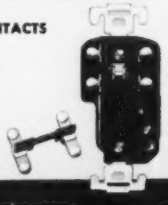
Side view of starter, showing heater element coiled around the stud.

THERMAL OVERLOAD BREAKER

Soldered ratchet of overload breaker is mounted on a heater stud. Around the stud is the coiled thermal element which heats the stud. Overload melts the solder; ratchet is released. This automatically opens switch with snap action.

DOUBLE BREAK SILVER ALLOY CONTACTS

Switch contacts are quick make, quick break. In the 2 pole construction, each side of line has two stationary contacts bridged by the double moving contacts. They need no contact maintenance, because they form no insulating oxides.



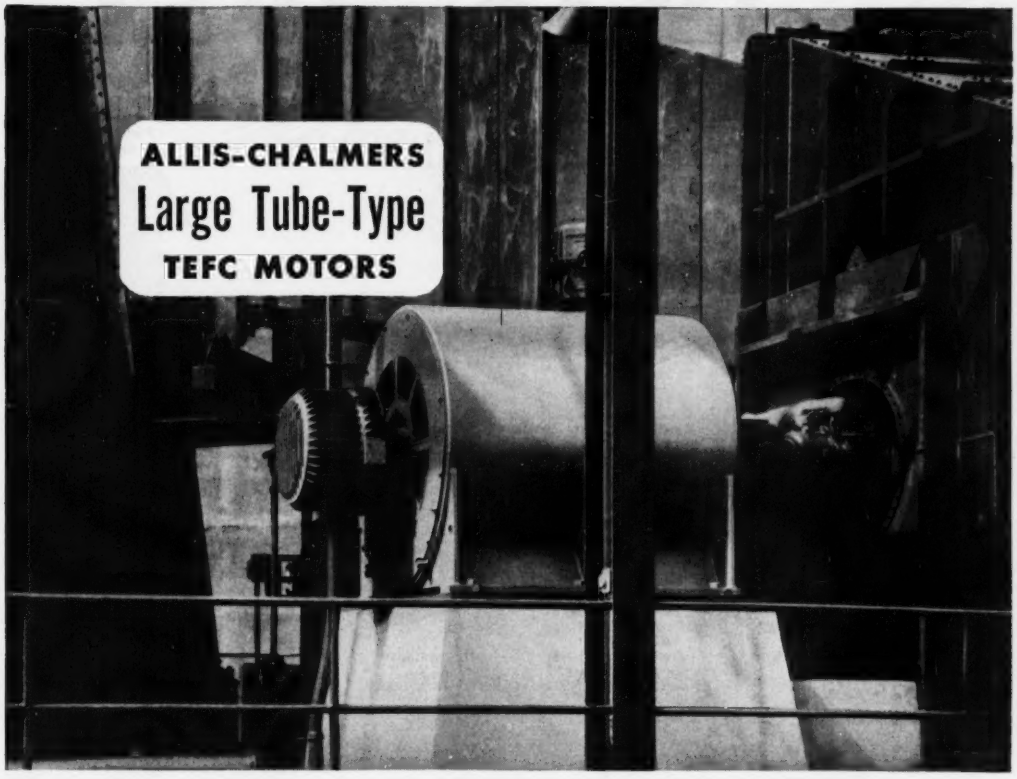
5-51-M

A-B Quality

ALLEN-BRADLEY

BULLETIN 600 STARTING SWITCHES

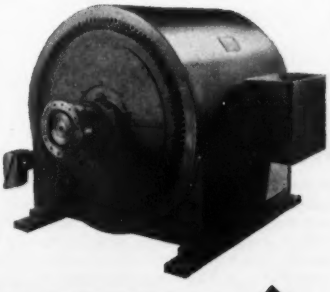
QUALITY



170,000 Hp Already Purchased

IN SIZES FROM 250 THROUGH 2500 HP

For really tough motor installations, central station engineers are turning to Allis-Chalmers large *tube-type* motors to get the peak reliability they know they need. Already over 170,000 hp of these totally-enclosed fan-cooled motors have been purchased. And practically 50% of the orders now are *reorders* from satisfied users.



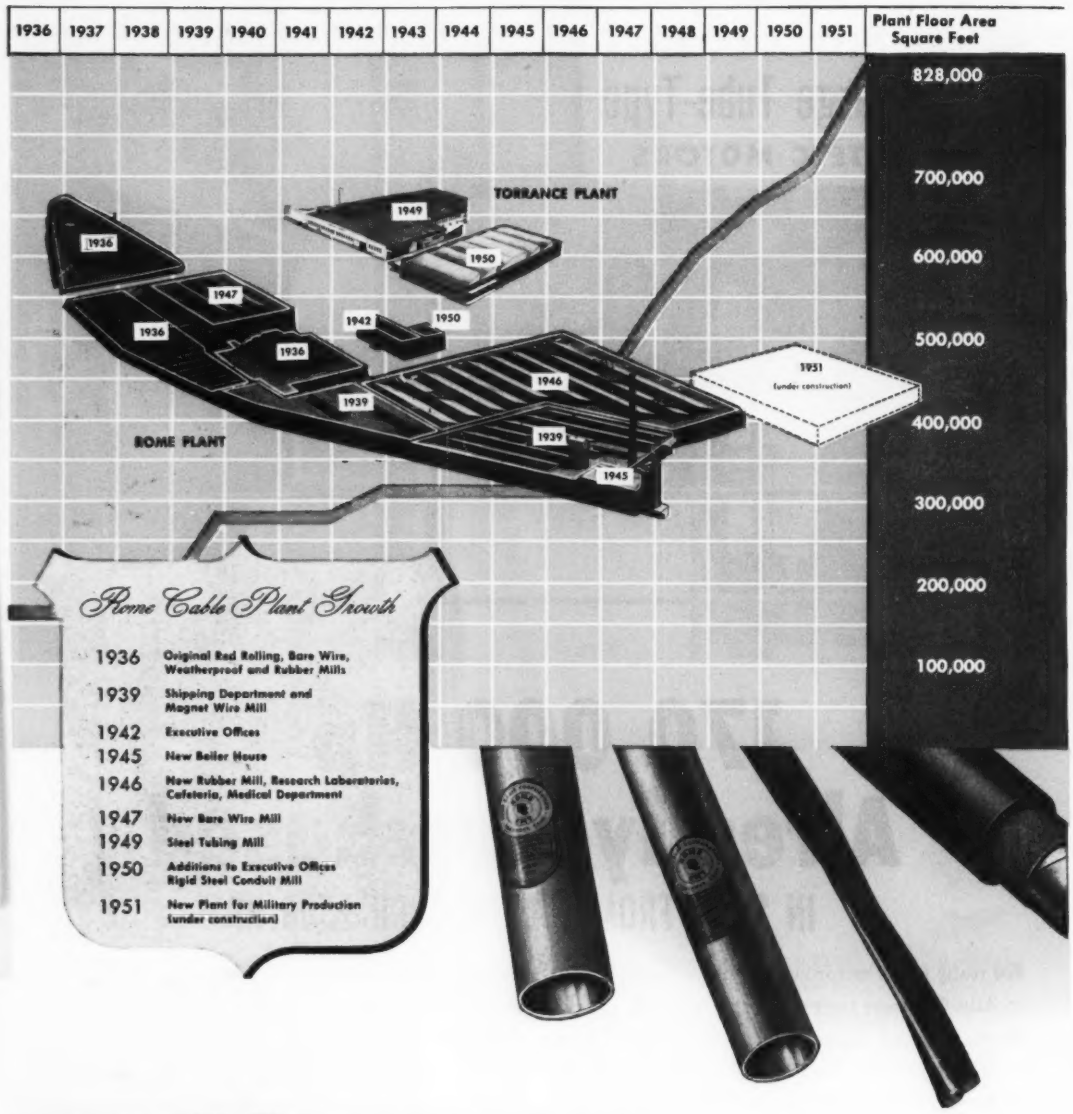
Advantages offered by the *tube-type* air-to-air heat exchanger design of these motors include:

1. Full internal air circulation—for efficient, even cooling—makes large ratings practical.
2. Complete enclosure — protects stator core and other electrical parts from corrosive conditions.
3. Self-cleaning action — results from generous flow of outside air through smooth, straight cooling tubes.

For more information about these operation-proved TEFC motors, contact your Allis-Chalmers representative, or write for new bulletin 05B7150A. Allis-Chalmers, Milwaukee 1, Wisconsin. A-3416

ALLIS-CHALMERS AC

1936 - 1951



Rome Cable Plant Growth

1936	Original Rod Rolling, Bare Wire, Weatherproof and Rubber Mills
1939	Shipping Department and Magnet Wire Mill
1942	Executive Offices
1945	New Boiler House
1946	New Rubber Mill, Research Laboratories, Cafeteria, Medical Department
1947	New Bare Wire Mill
1949	Steel Tubing Mill
1950	Additions to Executive Offices Rigid Steel Conduit Mill
1951	New Plant for Military Production (under construction)

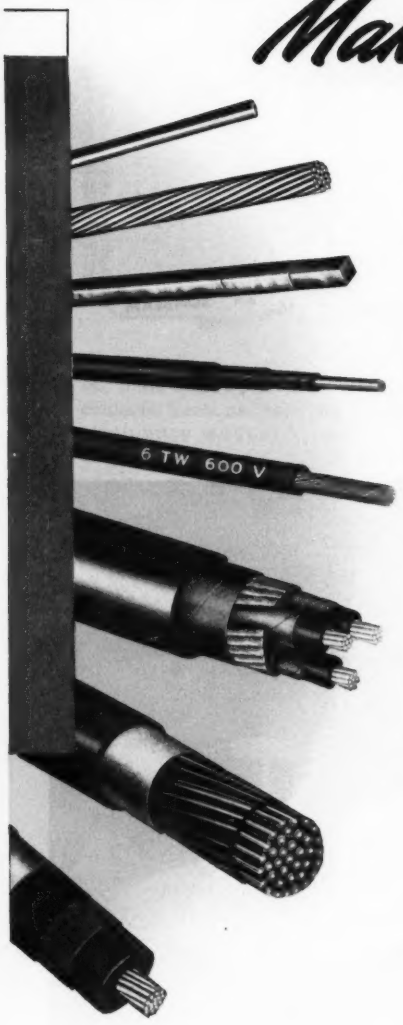
FROM BAR TO FINISHED WIRE . . . FROM SHEET TO FINISHED TUBE

In the manufacture of wires and cables, as well as steel conduit, control of Rome Cable quality is a step by step process. Starting with basic forms . . copper wire bars and sheet steel . . . Rome Cable products are manufactured entirely within its own plants. Equipment of the latest design, capable research and engineering, plus rigid inspection assure you of uniformly high quality.

Rome Cable offers, also a *personalized service* . . . based upon intimate contact between buyer and seller. Strategically located sales offices and warehouses across the nation bring Rome Cable as close to you as your telephone. In this period of defense priority, material shortages are acute and delivery requirements cannot always be met. You can depend, however, upon Rome Cable doing its best and when it cannot, honestly saying so.

Write today for your complimentary copy of the attractively bound book, "The Story of Rome Cable Corporation," and learn more about Rome Cable's facilities.

. . . You've Helped Rome Cable Make The Years Count



Fifteen years ago this July, we made our first shipment of wires and cables to the electrical industry. Your ready acceptance of Rome Cable products since that time has more than justified our confidence in that first shipment.

Today, electrical power surges through Rome wires and cables of many types, in many places . . . powering vital industry, lighting cities, safeguarding life, bringing convenience and comfort to homes throughout the land.

Burrowing deep for vital minerals, carrying heavy power loads from city to city, turning the wheels of the nation's industry . . . Rome wires and cables are unfailingly at work.

When the farmer flips his barn switch for that 4 A.M. milking . . . when a hundred and one electrical conveniences are called into use . . . Rome wires and cables are at work.

When television gives you a ringside seat, when an electric mixer whips up a cool summer drink . . . or, a neon sign steers you toward a highway hamburger . . .Rome wires and cables are at work.

Yes, even when a telephone voice directs an artillery barrage into Korean hills . . . the vital thread of communication may well be a Rome product. For, today Rome Cable is, again, producing for defense.

So, for fifteen years Rome Cable has steadily grown in meeting your ever-increasing needs. Rome research and engineering have designed better cables, have maintained dependable, high quality . . . *to give you of the electrical industry only the best.*

At this milestone in our progress, we, again, dedicate our future to ever higher quality of product and the desire to serve *you who have made these years count.*

ELECTRICAL CONDUCTORS AND STEEL CONDUIT
OF *BETTER QUALITY*

It Costs Less To Buy the Best

ROME CABLE
Corporation
ROME · NEW YORK
and
TORRANCE · CALIFORNIA

ROME CABLE ROME, N.Y.

WESTERN SALES OFFICES AND WAREHOUSES

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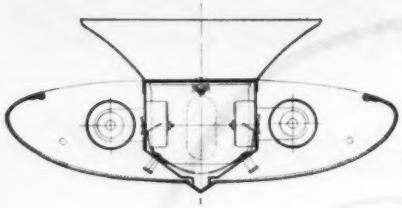
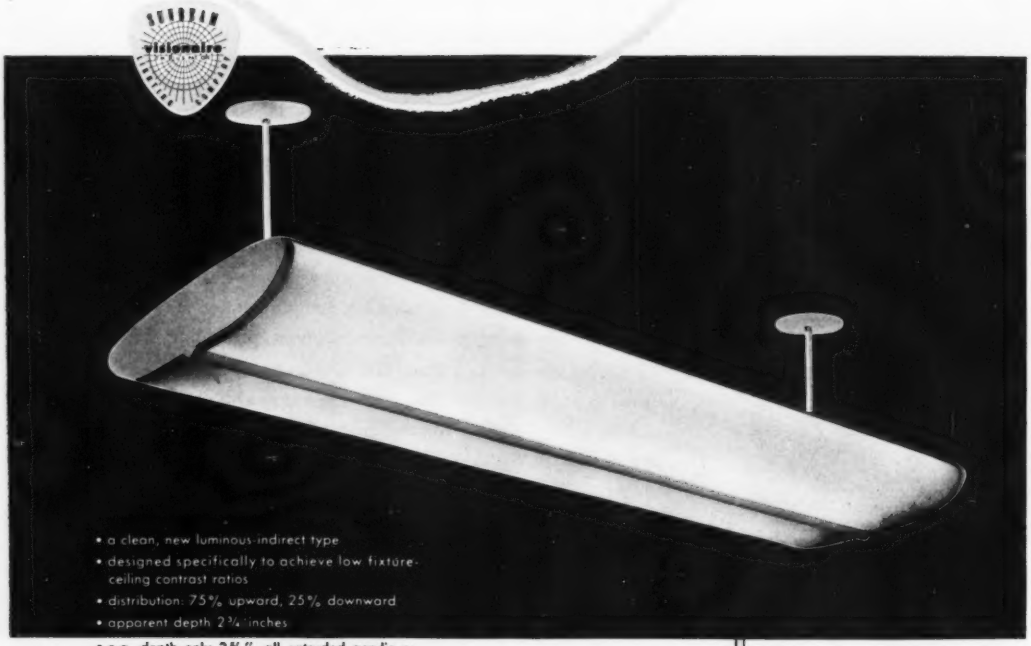
SEATTLE 4, WASH.
3404 Fourth Ave., So.

DENVER 3, COLO.
1160 Elati St.

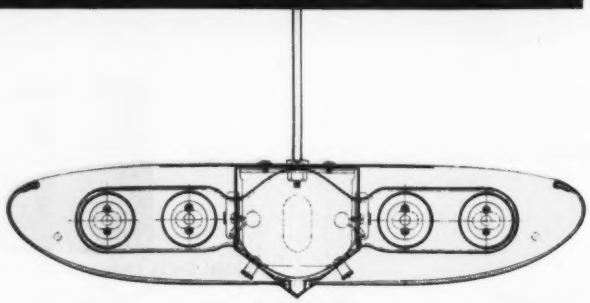


everybody's happy about *this* new SUNBEAM design



- a clean, new luminous-indirect type
- designed specifically to achieve low fixture-ceiling contrast ratios
- distribution: 75% upward, 25% downward
- apparent depth 2¾ inches

- o.a. depth only 3⅝". all extruded acrylic or styrene diffuser-reflector plastic panels. lamps removable without displacing plastic
- wiring and ballasts maintained without removing plastic panels from fixture
- designed for ceiling or pendant mounting
- 2 or 4 lamps, in all lengths and milliamp ratings
- die-formed heavy gauge metal end plates
- rolled aluminum rails support plastic edges
- spring loaded channel cover releases
- single or continuous runs
- adequate knockouts for easy installation



SUNBEAM LIGHTING COMPANY
777 EAST 14TH PLACE • LOS ANGELES 21, CALIF

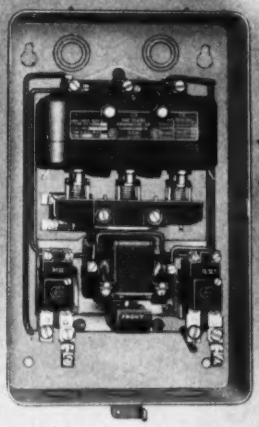
Setting new standards in starter performance

The

CLARK TYPE "CY" AC MAGNETIC MOTOR STARTERS

with the

NEW ARC QUENCHING PRINCIPLE



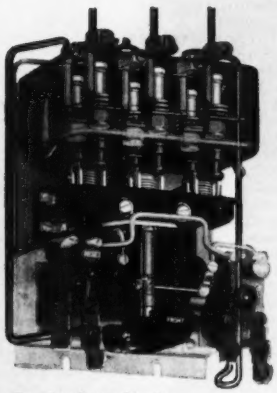
These rugged magnetic starters provide the extra protection and dependable operation of "Mill-Type" heavy-duty construction and design.

- No tools needed to inspect contacts. Contacts, coils, and stationary magnet frame easily removed.
- Melting alloy-type overload relays.
- Vertical lift clapper type magnet adapted to straight line guided movement, uses no springs.

The CLARK Type "CY" Starters feature the combined use of strong multi-turn magnetic blowouts with twin-break contacts.

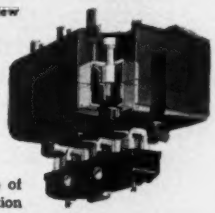
The Type "CY" starters employ an entirely new principle of arc interruption. The blow-out coils are concentric with the contacts. The magnetic field quenches the arc either by lengthening or confining it. By forced rotation the arc moves continually from a hot to a cold spot — minimizing burning or pitting of contacts. The solid upper arc shield prevents the accumulation of hot gases between wiring terminals—minimizing phase-to-phase failures*.

All parts in the arc chamber are copper, brass and steel, thus preventing carbonization. Absence of carbon and soot means longer contact life and lower operating temperatures.



Complete Power Circuit of CLARK Type "CY" Starter, Size 2

Phantom View Showing Arc Shield



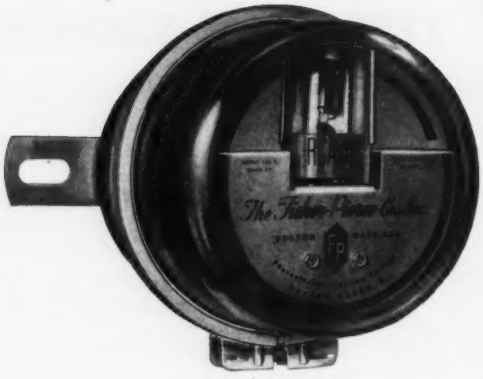
*Magnetic blow-out coils are used on all size 2 and 3 Type "CY" starters. Mill-Type construction is used on sizes 0 and 1.

Let a CLARK application engineer show you what this new line of CLARK Type "CY" starters means to you in increased production and lower maintenance.

THE CLARK CONTROLLER CO.

ENGINEERED ELECTRICAL CONTROL • 1142 EAST 152ND STREET, CLEVELAND 10, OHIO

Improved....



Series 63300 B

FISHER-PIERCE

PHOTOELECTRIC CONTROL

FOR STREET LIGHTING

This new Fisher-Pierce Control is the result of long experience in design and manufacture, combined with practical experience of more than 600 electric utilities in more than 20,000 installations.

The new 63300 B Control is mechanically and electrically interchangeable with existing controls. The same dependable Fisher-Pierce circuit, consistently giving tube life of more than 20,000 hours, has been retained. Improved spacing and insulation provides increased protection against lightning damage . . . up to 2500 volts rms Hipot. Mechanical design has been altered to provide maximum simplicity for greater economy of servicing.

New Address

The FISHER-PIERCE Co., Inc.

43 PEARL STREET, SOUTH BRAINTREE, BOSTON 85, MASS.

ELECTRICAL BOOKS

SYNCHRONOUS MACHINES, by Charles Concordia, 224 pages, 6x9, John Wiley & Sons Inc., $5.50. The fundamental circuit theory of transient performance of synchronous machines is developed—the theory currently used by engineers directly concerned with the prediction of machine performance. The general equations developed are applied to the calculation of transient short-circuit currents and torques; steady-state power, torque, and current, both in synchronous operation and during starting; and voltage disturbances occasioned by sudden application of load. Emphasis is placed on a more or less rigorous mathematical development and on obtaining a fundamental physical understanding of the behavior of synchronous machines.

ENGINEERING AND WESTERN CIVILIZATION, by James Kip Finch, 397 pages, 6x9, McGraw-Hill Book Co., $5. An entirely new approach to history which provides a socioeconomic analysis of the concurrent rise of engineering and the Western Way of Life. Engineering advances have been the primary forces in the creation of our modern, industrial economy in making possible ever higher standards of living for constantly increasing populations. The book outlines the history of engineering from the earliest beginnings, some 50 centuries ago, to modern times, noting and commenting upon the accompanying economic and social conditions and their effect upon technological development and progress. An attempt is made to avoid technical details and to present the story in a comprehensible manner suitable to the historical perspective.

SERVOMECHANISMS AND REGULATING SYSTEM DESIGN, Volume 1, by Harold Chestnut and Robert W. Mayer, 505 pages, 6x9, John Wiley & Son Inc., $7.75. The book starts from the basic mathematics, describes clearly the nature of the physical problems involved and proceeds to the solution of advanced designs. Emphasis is placed on feedback control concept for regulators and servomechanisms. Both the differential equation and Laplace transform methods of solving transient problems are presented. The importance of stability is stressed and many typical systems are illustrated.

ELEMENTS OF TELEVISION SYSTEMS, by George E. Anner, 804 pages, 6x9, Prentice-Hall Inc., $10.35. Begins with a study of closed systems, those that rely upon cable connections between sending and receiving apparatus. In this way the basic problems of any TV system can be studied independently of the problems associated with broadcasting the signal by radio. In the second part of the book the point of view is expanded to include the complications introduced by using a radio link in place of interconnecting cables. The last part is concerned with methods of superimposing color-perception on a system which is inherently color blind. Since details of a new art change rapidly, an attempt is made to concentrate on the basic principles involved. The new technique of dot interlace, which promises to become very important in the future, is covered.

ILLUMINATION EQUIPMENT

SMOOT-HOLMAN

INGLEWOOD, CALIFORNIA ®

MADE IN U.S.A.

This is the new low heat Ceiling-Lite designed to comply with recent Underwriters' Laboratories requirements effective January 1, 1951. Made in three sizes —

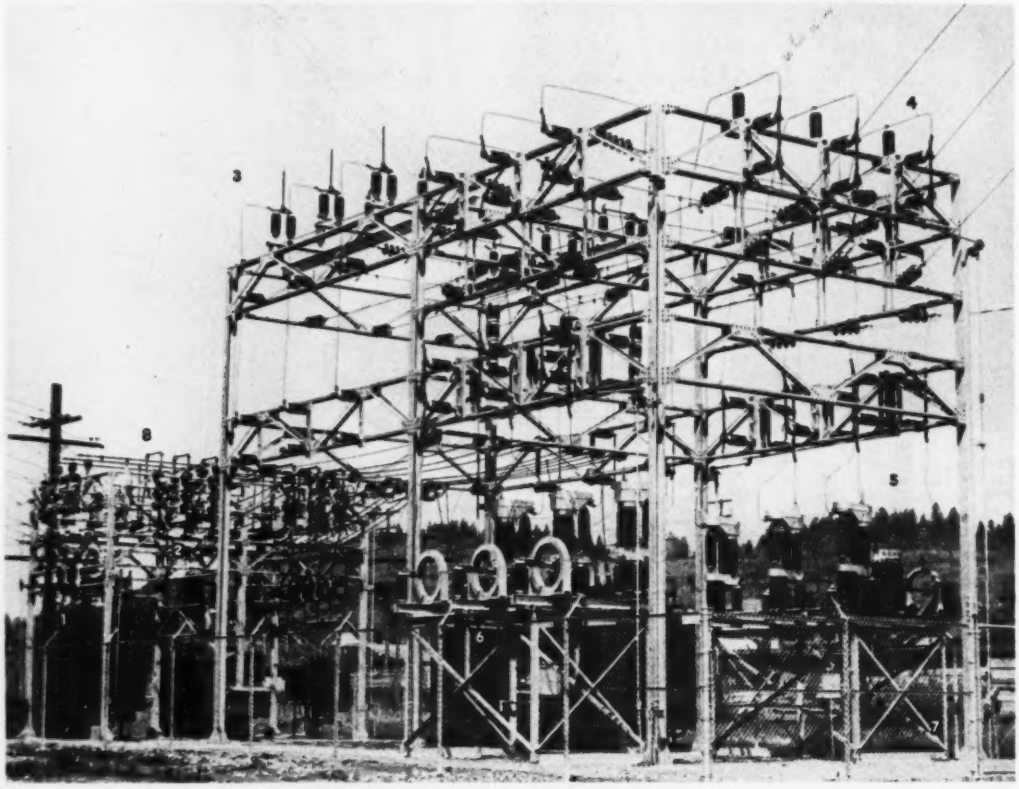
No. LH-1110 — 10" glass
Approved for 200 Watts

No. LH-1112 — 12" glass
Approved for 300 Watts

No. LH-1114 — 14" glass
Approved for 300 Watts

SMOOT-HOLMAN COMPANY Inglewood, Calif. Offices in Principal Western Cities • Branch and Warehouse in San Francisco

SCHWAGER-WOOD CORPORATION



COMPLETE SUBSTATION FOR LEWIS COUNTY PUD

Yes *complete*. This entire substation, recently placed on the lines of the Lewis County Public Utility District at Chehalis, Washington, is a product of the Schwager-Wood Corporation. Design, engineering, all materials (except transformers, regulators and low voltage oil circuit breakers), and fabrication were done by our organization. Note the following S-W features illustrated in the above photo:

1. **Hook Operated Disconnects—Type HA**
2. **Tilting Insulator Group Operated Disconnects—Type RS**
3. **Rotating Insulator, Vertical Break Group Operated Disconnects—Type TA**
4. **Rotating Insulator, Side Break Group Operated Disconnects—Type SSB**
5. **Interrupter Switches—Type IA**
6. **Air Insulated Current Transformers**
7. **Substation Steel Design and Fabrication**
8. **Bus Fittings**

For further information on this installation, or for other high-voltage electrical equipment, contact our nearest representative, or write

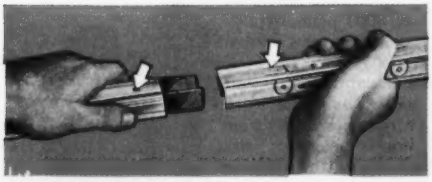
SCHWAGER-WOOD CORPORATION
8024 S.W. 35TH AVE.
PORTLAND 19, OREGON

A. B. SMEDLEY	K. M. RYALS CO.	LOVE ELECTRIC	SLAYBAUGH-THOMPSON CO.
Box 67-c	461 Market St.	732 Pacific Ave.	100 13th Ave.
PASADENA, CALIF.	SAN FRANCISCO, CALIF.	TACOMA 2, WASH.	DENVER 4, COLO.

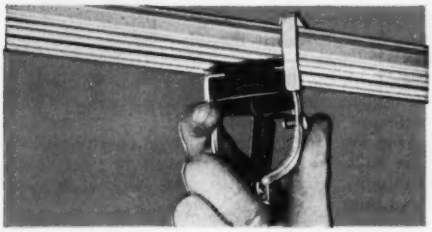
RUSSELL D. HEATH . . . 127 Barclay St. . . . NEW YORK 7, N. Y.

Flexible lighting system that can be easily changed without rewiring

Move or add lights *anytime, anywhere* with BullDog Universal Trol-E-Duct



Duct sections are joined without tools, nuts or screws. Prefabricated and standardized in lengths from one to ten feet, they can be dismantled and reinstalled anytime, anywhere without scrapping a single part.



To tap off power at any point along the slot, simply insert twist-out plug and give it a 90° turn. Plugs are grounded on steel casing before contacts touch bus bars; narrow-access slot protects operator.

Trolley-type outlets are used where mobility is a prime requisite—such as for small portable tools or for drop-cord lighting in stock bins and inspection areas.

Safe, simple, quick! Tap off power from totally enclosed bus bars *at any point* along the continuously slotted duct with handy trolleys or twist-out plugs. Universal Trol-E-Duct both supports and supplies current to these fluorescent lighting fixtures.

Meet changing conditions quickly, economically with this truly flexible lighting system.

To move or add lights, simply pick the right spot and insert handy twist-out plug or trolley. Every inch of this money-saving 50-ampere duct system is a tap-off! Prefabricated and standardized in lengths from one to ten feet, it can be dismantled and moved to a new location without scrapping a single part.

Call in your nearby BullDog Field Engineer for more information about this modern lighting system. He will be glad to show you an installation near your own office. Or write BullDog direct for descriptive literature.

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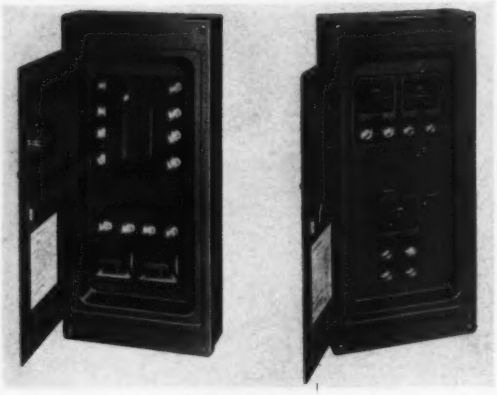
San Francisco 3, Calif.

Paul L. Mullenbach Co.
3008 E. Olympic Blvd. Tel. Angelus 9-8101
Los Angeles 23, Calif.

PRODUCT NEWS



Service Entrance Equipment

(1) Square D Co., 4335 Valley Blvd., Los Angeles 32, Calif.

Two new types of 100-amp fusible service entrance equipment are claimed to take care of increased electrical loads in present-day homes.

The series types (left in illustration) utilize a new 100-amp fusible pull-out disconnect that controls all branch circuits. These devices are available with two 220-v, 30- or 60-amp branch circuits for range, water heater, dryer, etc., and either 8-, 10- or 12-plug fuse, 110-v circuits for such loads as lighting, furnace, kitchen and laundry.

The parallel mains types (right in illustration) connect the three 220-v, 30- or 60-amp pull-out circuits in parallel, thus eliminating need for a main disconnect. One of the pull-outs controls 4-, 6- or 8-plug fuse, 110-v circuits for such loads as lighting, furnace, kitchen and laundry. The other pull-outs control the range, water heater, dryer or other 220-v circuits.

Flush and surface type covers are interchangeable. The interiors are mounted on a removable pan to facilitate mounting and wire pulling. These and other features such as solderless connectors, tangent knockouts and engineered gutters are said to make for quick, easy installation.

Bus Duct Available in Four Standardized Types

(2) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

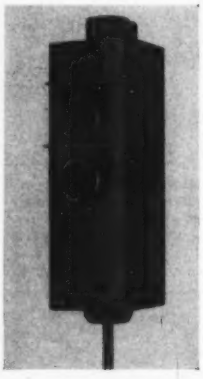
Four standardized types of bus duct for a variety of industrial power distribution system applications include: (1) plug-in duct for branch runs, providing power take-off outlets every 12 in.; (2) weatherproof feeder duct for outside runs (transformers to switchgear); (3) low-impedance duct for long feeder runs, or where minimum voltage drop is important; (4) weatherproof low-impedance duct for runs between transformers and switchgear, where the duct must withstand high short-circuit stresses.

All types except weatherproof feature channel construction of the top, sides and bottom for rigidity. Bus bar joints are silver plated. Alignment of the duct is made by cantilever clamp hangers. The entire structure is Bonderized for corrosion resistance and better paint adhesion.

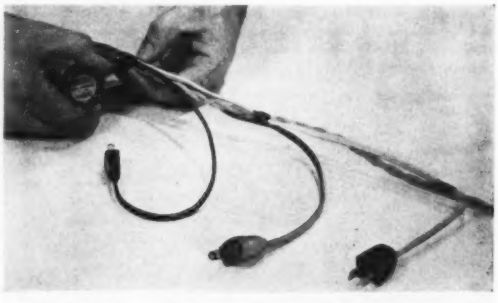
With plug-in duct, power can be taken off every 12 in. on alternate sides of the duct, eliminating long secondary cable runs. Sliding covers over plug-in openings provide easy access and facilitate inspection. This duct meets Underwriters' specifications.

Pendant Control Station

(3) Allen-Bradley Co., Milwaukee, Wis.



The Bulletin 800T pendant push-button station is a new oiltight control station, designed for use as a portable control or for suspension above a machine where it may be reached easily while the operator is near his work. Pendant push-button stations may be obtained in sizes having three to 10 units including the stop. Standard stop unit is a wobble stick in the bottom of the enclosure, but it can be furnished also as a mushroom head mounted in the bottom or in the front of the enclosure. All enclosures used with the 800T stations have oiltight control units. Each enclosure has a cable anchor at the top. Special pendant-type control stations also can be built, with any combination of pilot lights, push-button units, selector switch units, jogging units or key-operated units.



(4) Used in industry for six years, No. 33 Scotch brand waterproof electrical tape is being introduced to the home and farm market. It is black and glossy, with a smooth surface that resists dust and lint; has a dielectric strength of 10,000 volts and an insulation resistance of 200,000 megohms; is listed by Underwriters' Laboratories. The tape resists water, oil and chemicals; withstands temperatures up to 170°F. It has a rubbery backing of vinyl plastic that enables it to conform snugly to odd-shaped objects. Distribution is through electrical shops, radio and appliance shops, farm implement dealers, auto dealers and hardware stores, according to the manufacturer, Minnesota Mining and Manufacturing Co., 900 Fauquier St., St. Paul 6, Minnesota

CONSIDER THESE
4 G-E WIRING FACTS
WHEN YOU EXPAND YOUR ELECTRICAL SYSTEM

General Electric Construction Materials Division at Bridgeport is a headquarters for wiring progress

Through constant research and precision manufacturing methods, the G-E Construction Materials Division sets the pace with modern and high-grade wiring materials.

Through distributors in every locality and specialists in the local G-E offices, the G-E Construction Materials Division offers you complete service on any type of wiring problem.

For information on any G-E wiring material product, contact your local G-E Construction Materials distributor, or write Section K-58-725, Construction Materials Division, General Electric Company, Bridgeport 2, Conn.

1. Q. *HOW CAN YOU REDUCE INSTALLATION TIME FOR NEW POWER AND CONTROL CIRCUITS IN LIGHT INDUSTRIAL AND COMMERCIAL BUILDINGS?*

A. Use G-E Electrical Metallic Tubing. This lightweight, thin-wall tubing cuts installation time because it's easy to handle, easy to bend, and easy to install.

2.

Q. *WHAT RACEWAY WITHSTANDS MACHINE VIBRATION AND PROVIDES BOTH FLEXIBILITY AND PROTECTION?*

A. G-E flexible steel conduit is ideal for machine-wiring installations. This tough raceway can be hand-shaped around obstructions where space is limited. It stands up under severe operating conditions where motors and other equipment cause vibration.

3. Q. *WHAT ARE THE ADVANTAGES OF THE G-E REMOTE-CONTROL WIRING SYSTEM IN INDUSTRIAL AND COMMERCIAL BUILDINGS?*

A. G-E remote-control wiring system provides control of corridor lights from central locations to assist watchmen and cleaning crews. The small lightweight control wires can be removed easily as partitions and floor layouts change.

4. Q. *HOW CAN LAYOUT TIME BE SAVED WHEN PRESENT INDUSTRIAL ELECTRIC POWER SYSTEMS ARE EXPANDED?*

A. G-E Varnished-cambric Interlocked-armor cable—carrying its own flexible raceway—presents no complicated layout problems. This ready-to-install cable can be bent around obstructions, strung over long runs, laid up on existing beams, or installed on racks.

You can put your confidence in—

GENERAL ELECTRIC

Service Tap

(5) O. Z. Electrical Mfg. Co., 262 Bond St., Brooklyn, N. Y.

This new service tap is designed to swivel for easy insertion of conductors and is constructed to keep tap assembled when clamp is open. It is cast of high-strength copper alloy for heavy-duty service connections, both inside and outside. Serrations on body and cap prevent cables from working loose after tap is installed. Conductors are forced into high-pressure contact by means of two standard hex-head cap screws. Spacer is available if desired for separating individual conductors. It is claimed that the tap can be used for dead-ending wires. Smooth, rounded edges permit easy taping. Available from No. 2 to 1,000 mcm (main); No. 10 to 1,000 mcm (tap).

Single Cable for Service Drop and Secondary Line Applications

(6) Kaiser Aluminum & Chemical Sales Inc., 1924 Broadway, Oakland 12, Calif.

Self-supporting Triplex conductor, in which three wires are loosely stranded into a single cable, is available in a range of types and sizes for service drop and secondary line applications. In this conductor two neoprene- or polyethylene-covered weatherproof wires are stranded about a bare neutral messenger. Triplex comes in AWG sizes 2, 4 and 6, with all-aluminum, ACSR or reduced size ACSR messenger. A recent bulletin contains engineering specifications.

Pig Tail Ground Rod

(7) A. B. Chance Co., Centralia, Mo.

Five turns of 12-gage, soft-drawn copper wire are bonded to the upper end of this pigtail ground rod to give maximum contact efficiency. The solder-dipped copper conductor is formed in a tie at the upper end to prevent it from stripping off the rod. Ground connection is made to the 18-in. pigtail section of the conductor. Drive point rod is high carbon steel, heavily galvanized to resist corrosion.

Pressure Sensitive Tape

(8) Topflight Tape Co., York, Pa.

Print-Stix can be furnished in flat individual pieces, in almost any size, printed in any number of colors, square or die-cut and in any quantities above the 5,000 minimum order. It has a self adhesive principle that requires no wetting or use of adhesives when applied.

not one, not two, but

THREE PLANTS TO LIGHT THE WEST

What's behind the rapid sweep of All-Brite fluorescent fixtures across the West? Clean contemporary design... quality construction... highest lighting efficiency... Yes, all of these... but more. Above all, it is the solid endorsement of All-Brite luminaires by Western architects, engineers and builders that has placed All-Brite fixtures ahead of the rest in the West.

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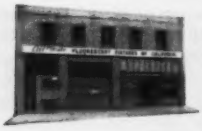
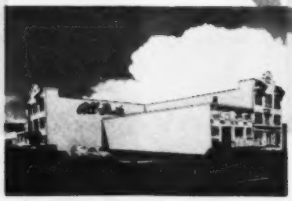


portland: 1318 S. W. FIRST AVE.



san francisco: 3320-10th STREET

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All-Brite LIGHT OF THE WEST

originators of FLUORESCENT WESTERN CONTEMPORARY luminaires

REASON for CONFIDENCE
. . . in Peace or War

. . . that's what the trademarks and brand names of American producers establish. For never has a country accumulated such wealth of designing and engineering talent, such monumental means for producing both the necessities and luxuries of the day, or such massive potential for meeting the needs of tomorrow—however vast and varied they may be.

Accordingly, we take particular pride in *our* personal emblem. Representing a wide range of alloys for the electrical, electronic and heat-treating industries, it is the very symbol of quality and dependability to a host of manufacturers thruout the nation. We are well aware of our obligation to uphold its reputation—in peace or war.

So if your products demand electrical resistance material of outstanding uniformity, high stability, and long life . . . or if you require radio alloys for electronic uses . . . or high heat-resistant equipment . . . *consult with us.* Our fifty years' experience is at your disposal.

As recipient of the highest Armed Services Award in 1918, and of no less than five Army-Navy "E" Awards in World War II, it is logical that the resources of this firm should be engaged to an unprecedented extent in meeting the demands of the present emergency. However, we stand ready to make recommendations based upon your specific requirements, and shall be glad to serve you to the best of our ability.

One thing is sure: Your use of a D-H product will prove a source of confidence—confidence not only in Driver-Harris products per se, but, in a wider sense, confidence in the capacity of creative America to meet any situation, *come what may.*

Manufacturers of world-famous Nichrome and over 80 other alloys for the electrical, electronic, and heat-treating fields.*

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*T. M. REG. U. S. PAT. OFF.

Now...
±10% Regulation...
AT THE SUBSTATION
OR ON THE LINE

in 16 1¼% Steps

with New URL-16 Voltage Regulator

AN IMPORTANT ADDITION TO THE URL-8 LINE... ASSURES MORE REVENUE FROM HEAVILY LOADED RURAL AREAS Here's a new low-cost answer to regulation in rural or suburban areas . . . at the substation or on the line. This new regulator increases the URL line for application in locations where a ± 10% regulator is required. Sixteen 1¼% step operation meets these requirements under any load condition, at a minimum of cost. Light weight, combined with greater range and close voltage regulation, provides new installed economy.

CHECK THESE MONEY SAVING FEATURES...

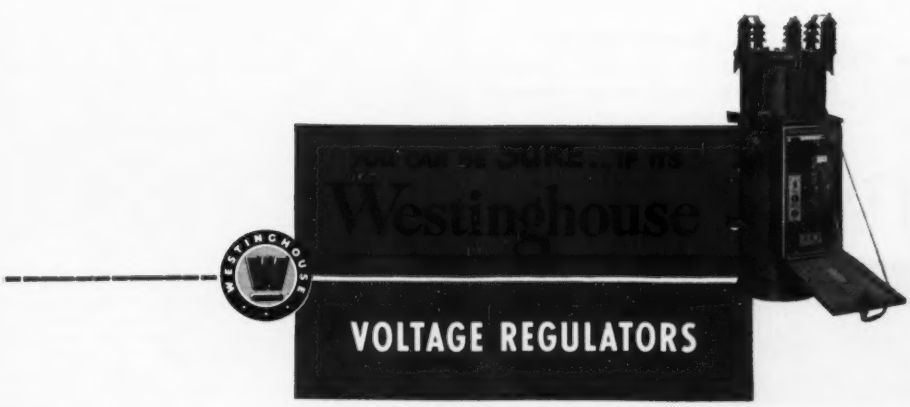
10% REGULATION, RAISE AND LOWER, IN 16 STEPS OF 1¼% EACH . . . Combines light weight for single-pole mounting with regulation for substation application. A double-purpose feature that cuts costs. Regulator retains every outstanding URL feature, including cover-mounted bushings and co-ordinated surge protection by means of externally mounted arresters.

SIMPLE TAP CHANGER, WITH REVERSING SWITCH FOR ± 10% REGULATION . . . Has direct motor drive, quick motion. Separate oil immersion. Cuts maintenance. Assures positive arc interruption and minimum voltage variation during tap changing period.

PACKAGE CONTROL . . . Voltage regulating relay and auxiliary relays are mounted in a common flexitest chassis. Inherent inverse time-delay action of the voltage regulating relay assures long contact life. Separate resistance and reactance line-drop compensator provides rated line-drop compensation even though regulator is carrying only 67% of rated load.

IMPROVED CONTROL CABINET . . . Control cabinet door is hinged at bottom to provide a "workbench" when in the open position. Control cabinet may be mounted integrally with the regulator or on the pole below the regulator.

FOR FURTHER INFORMATION on the new URL-16 Regulator, call your Westinghouse representative, or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-70601



Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.

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WE'LL SOLVE YOUR GENERATOR AND MOTOR BRUSH PROBLEMS FOR YOU

A motor is just as efficient as its brushes. Often an excellent motor is put into operation equipped with brushes selected for general use. Atmospheric conditions, temperature and overloading make for inefficiency in performance. Our engineers will gladly make the proper recommendations to increase motor efficiency with the use of proper brushes.

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THE OHIO CARBON COMPANY
12508 GEREA ROAD • CLEVELAND 11, OHIO

Insulating Material

(9) Irvington Varnish & Insulator Co., Argyle Terrace, Irvington 11, N. J.

Teflon-coated Fiberglas is said to combine exceptionally good heat resistance, mechanical strength and toughness, nonadhesive surface characteristics and extreme chemical inertness. As an electrical insulating material, it meets class H requirements for high-temperature operation. It has been employed successfully as a coil separator, slot liner and coil wrapper in motors and generators, according to the manufacturer. It is claimed to be particularly suited for use in equipment designed to operate in corrosive atmospheres. It is available in thicknesses from .003 to .010 in. Standard width is 38 in. untrimmed; tapes can be slit to specification in widths as narrow as ¼ in.

Constant-Current Regulators

(10) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

A new line of smaller pole- and platform-type constant-current regulators for street lighting, type CPH, is available in ratings of 5 to 30 kw, with 6.6- or 20-amp secondary current; has a 2,400-v primary connection that operates on 2,280 to 2,520 v. A special 2,160-v primary tap provides for operation on 2,050 to 2,270 v.

A new horizontal tank-type bushing allows insertion of leads from either of two directions and a nonbreakable hand-operated knob at the end of the bushing eliminates need for tools when making connections. All models have round tanks; are made of copper-bearing steel; Bonderized to provide good weather resistance; are manufactured in standard design or as packaged units having built-in protective switching devices.

Conduit Hangers

(11) The Kindorf Co., 4060 Harlan St., Emeryville 8, Calif.

Supplementing the manufacturer's line of supports for multiple-run conduit installations, the B series is a low-cost hanger for single runs. According to the announcement, with these hangers a single run of conduit can be hung quickly from structural steel I-beams, channels, angles or columns or from concrete inserts of wood-frame buildings. The series consists of seven basic devices that assemble into many different combinations. They come ready to use, are interchangeable and reusable.

End Seal Waterproofs Cable Sheath Terminals

(12) The Okonite Co., Passaic, N. J.

An inexpensive moisture seal for terminating multiconductor sheathed cables is cone-shaped to receive filling compound. It is claimed to be easily and quickly slipped over the cable and to eliminate friction tape or makeshift windings.

Applicable to cable diameters of from ¾ to 2 in., the End Seal snugly fits over the cable sheath, preventing compound leakage. The compound hardens to form a neat, permanent, moisture-proof seal and to keep the conductors properly spaced.

The device is made from the same neoprene formula used in Okonite-Okoprene and Okolite-Okoprene cables and is said to be mechanically strong, with long-time resistance to sunlight, air, ozone, oils and chemicals. Details are in bulletin OK-2091.

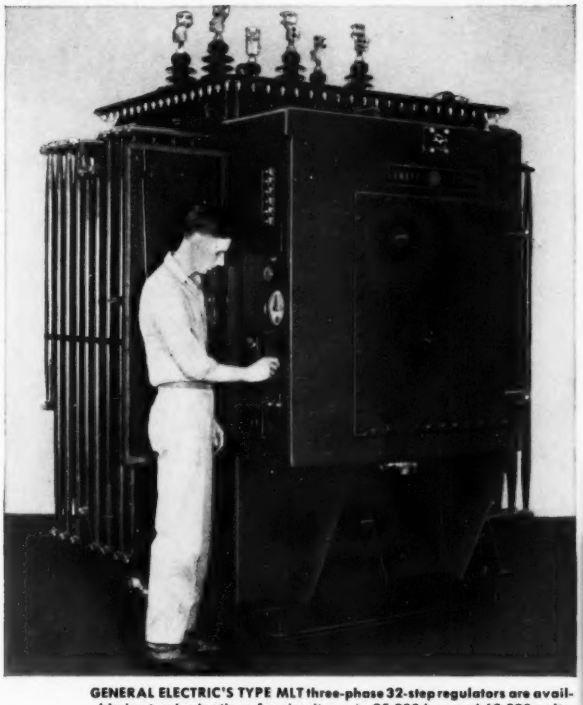
Terminals

(13) The Thomas & Betts Co. Inc., 70 Butler St., Elizabeth, N. J.

A new line of terminals is claimed to end risk of short circuits between closely spaced wires. Known as self-insulated Sta-Kon terminals, the units are integral, one-piece assemblies combining a metallic portion that grips both the wire and wire insulation tightly and permanently with a single staking operation, and a translucent, firmly anchored terminal insulator of specially formulated nylon. Details in bulletin S4.

(14) BELLS—A new line of midget bells offered by Signal Engineering & Mfg. Co., 154 W. 14th St., New York 11, is available in 2½- or 3-in. diameters for operation on standard voltages, with adapter plate for mounting on standard outlet boxes. Details in bulletin MB-59.

Class I Accuracy in these G-E Regulators —at no extra cost



GENERAL ELECTRIC'S TYPE MLT three-phase 32-step regulators are available in standard ratings for circuits up to 25,000 kva and 69,000 volts.

GENERAL ELECTRIC'S TYPE IRS induction voltage regulators provide the finest regulation obtainable for heavily loaded, urban feeders.

This means better utilization of your feeders . . . they can now carry heavier loads for greater distances.

Because of today's increasing power demands on your feeders, General Electric is especially proud to be the leader in bringing you this significant new system design tool at NO EXTRA COST!

The controls on all station-type feeder voltage regulators now meet rigid ASA Standards for Class I devices. This means that they have an accuracy of at least 99%—regardless of operating changes in temperature, frequency, or load.

With these highly accurate controls on your regulators, more drop can be tolerated in a regulated feeder without at any time exceeding established voltage limits. Therefore your older feeders can carry heavier loads and your new construction can be designed with this increased load-carrying capacity in mind.

For further information on what Class I accuracy can mean to you, get in touch with your G-E representative. *General Electric Company, Schenectady 5, New York.*

404-82

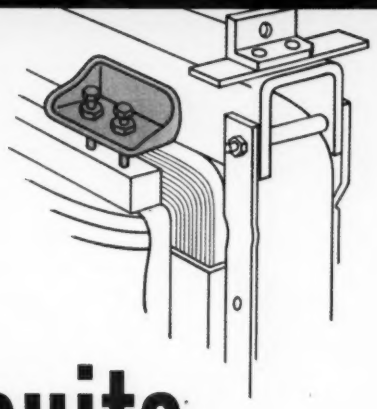
GENERAL ELECTRIC

SPIRAKORE* TRANSFORMERS

mechanical strength to

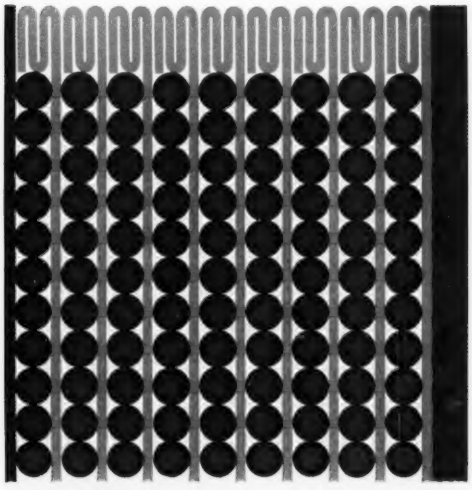
An improved clamping construction gives the modern Spirakore transformer greater mechanical strength than ever before.

As an example, on transformers 75 kva and larger the ingenious jack-screw device shown at the right holds the windings accurately and permanently in place.



take short circuits

General Electric's improved Spirakore* transformer is outstanding in its ability to resist short-circuit stresses. An improved clamping construction, shown above, is part of the reason Utilizing the mechanical strength of the paper insulation, as well as its electrical strength, is another. Also, the basic design of the wound core adds strength as compared with older designs.



Edges of the tough paper insulation are folded over the winding layer to hold coil conductors securely in position even under short-circuit conditions. On smaller units the paper insulation is pretreated with a special varnish which softens and flows around each conductor when core-and-coil unit goes through heat treating. Upon cooling, this thermo plastic material permanently hardens to bond conductors and insulation together.

Important as all this is, it is still only one advantage you get with today's Spirakore distribution transformers. You get a wound core in single-phase and most three-phase ratings—a G-E development that has resulted in direct savings to utilities that now total millions of dollars. You get high impulse strength—so high as to have made lightning failures almost insignificant on transformers delivered since 1943. You get vacuum-tight sealing that stops breathing, prolongs oil and transformer life. You get an improved Melaglyp† paint that increases durability to weathering by 50 per cent.

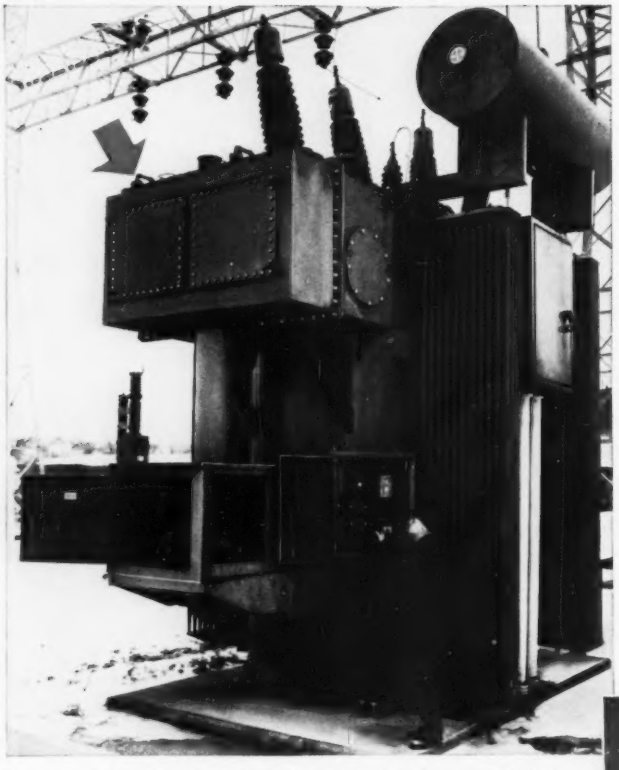
All of these changes have kept Spirakore ahead—kept it the standard for others to try to equal. It's the finest distribution transformer you can buy.

*Registered trademark of the General Electric Company.
†A new, greatly improved G-E paint made with melamine-modified Glyptal (registered trademark of the General Electric Co. for alkyd resin).

If you haven't seen this 32-page, full-color book on the Spirakore transformer, get one from your local G-E representative, or write 402-108, General Electric Company, Schenectady 5, New York.

GENERAL ELECTRIC

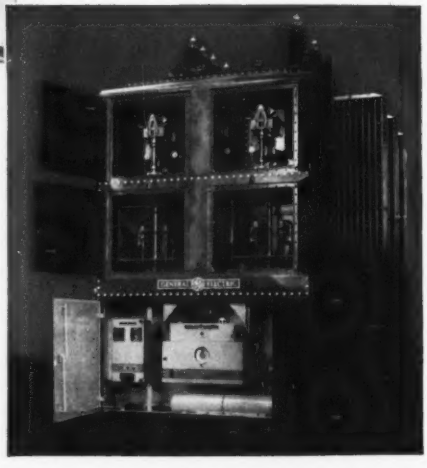
402-108



At its current rate of operation the load-ratio-control equipment on this G-E transformer at Lewiston, Maine, will require no servicing until about 1962.

106,554 tap changes since 1947

Arcing tips inspected, found good for 400,000 more operations



On more recent G-E transformers the contactor compartment is below the one for tap selectors instead of in front of it, to further improve accessibility. The motor drive has also been made more accessible and all controls have been grouped on a hinged panel for operating convenience. Basic design, however, remains unchanged, including electrostatic shielding that prevents dangerous carbon deposits.

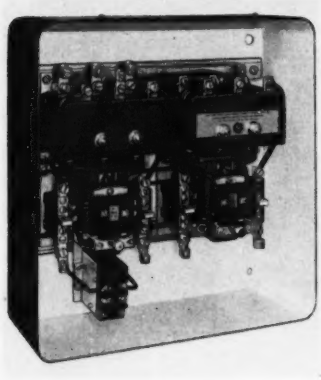
Central Maine Power Company recently inspected the load-ratio-control equipment on this transformer rated 13,333 kva (with fans), 115,000Y to 12,000-volts. This was the first opportunity the company had to inspect contacts since installation in 1947. The counter read 106,554 tap changes under load. Here are pertinent parts of the report:

> *"Arcing tips are in good condition, and should last 500,000 tap changes as estimated in the G-E Instruction Book. All bearings, pins, cam rollers and cam surfaces are in excellent condition and show no wear. Oil was slightly carbonized and insulating rods and panel showed some carbon streamers, but there were no carbon deposits in the areas protected by electrostatic shielding. Oil was filtered and re-used. Surfaces were cleaned."*

This report is typical. *At its present rate of operation, this equipment will not require further servicing for about 11 more years.* General Electric has now installed load-ratio-control equipment on 37,665,618 kva of transformers—and the reliability record matches the outstanding record of the transformers themselves. *General Electric Company, Schenectady 5, New York.*

401-20

GENERAL ELECTRIC



Part Winding Starter

(15) Allen Bradley Co., Milwaukee 4, Wis.

This new Bulletin 736 a-c part winding starter is for use with motors that employ two separate parallel windings, star or delta, to obtain increment starting. It consists of two across-the-line starters and a pneumatic timing mechanism mounted below one starter and operated by the starter's solenoid plunger.

Pressing the start button immediately closes the first starter and this energizes one of the two parallel windings. Meanwhile the timer is in operation and after a few seconds it energizes the second starter. With both starters closed, full line current is supplied to the motor through both windings, each using 50% of the total current drawn.

According to the manufacturer, use of part winding does not produce objectionable current surges obtained with autotransformer starting since the motor is not disconnected from the line during the starting period.

Pole-Mounting Capacitor Bank

(16) Cornell-Dubilier Electric Corp., South Plainfield, N. J.

A pole-mounting 225-kvar switched power factor improvement capacitor bank is for operation on 2,400/4,160-, 3-phase distribution circuits. Arrangement of the electrically operated oil switch and the capacitor units provides a symmetrical and weight-balanced assembly. Two of these units may be installed from a common cross arm permitting short symmetrical connections and maximum accessibility for service and maintenance, the manufacturer reports.

(For bulletins, fill in the coupon on page 50)

Planning New Distribution Lines?

Put it up to PINCO!

Putting up a Distribution Line is no problem when you "Put it up to Pinco" . . . because Pinco has everything you need—Insulators . . . Line Hardware . . . Guy Strains. Pinco makes them all, and they're all "tops" in performance as thousands of miles of such lines can prove. Engineered and built to distribution line requirements, Pinco products are not only RIGHT *for* the Job but RIGHT *on* the Job . . . for You!

Refer to Pinco Catalog No. 49 for complete electrical and mechanical characteristics.

No. L 63
Pinco Pin Type

No. L 223
Pinco Pin Type

No. L 1510
Pinco Suspension Type

Pinco Strain or Dead-End Clamps
No. L 4038
No. L 1921
No. L 4550
Pinco Guy Strains
Nos. L 289
L 506
L 504
L 502

The Porcelain Insulator Corporation
769 Main St., Lima, N. Y.

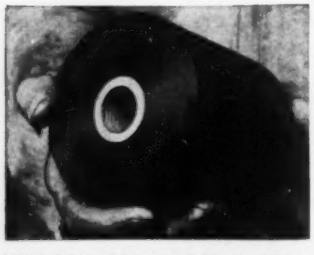
PINCO INSULATORS

MIDWEST UTILITY COMPANY PROVES IT ON BURIED HIGH-VOLTAGE CONDUCTORS...

Plastic tape knocks the tar out of tough coating jobs!

Hazardous, hard-to-handle hot tar coatings are a thing of the past now that plastic-backed "SCOTCH" Electrical Tape No. 22 protects buried conductors against corrosion. A midwest utility company recently completed installation of 1¼ miles of underground high-voltage pipe type cable, and the entire surface of three inch copper risers was given safe, dependable protection with this tough tape. Galvanic action, earth acids, bacteria and fungi are sealed out.

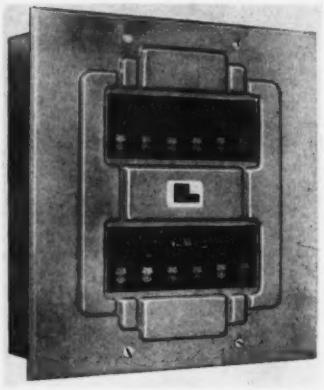
On every kind of job, small or large, "SCOTCH" Electrical Tape No. 22 can cut your costs, save you time without the messiness and danger of hot coatings. Patching and repairing are easier, too! No activator is needed for the specially developed pressure-sensitive adhesive. It sticks at a touch and holds dependably. See your jobber today.



WIDE ROLL of "SCOTCH" Electrical Tape No. 22 covers large areas quickly. Tape is also available in 36-yard rolls and in widths of ½, ¾, 1 and 2 inches. Contains no sulphur bearing compounds. Application three times faster than conventional materials.

SCOTCH BRAND Electrical Tape No. 22

The term "Scotch" and the plaid design are registered trade-marks for the more than 100 Pressure-sensitive adhesive tapes made in U.S.A. by **MINNESOTA MINING & MFG. CO.**, St. Paul 6, Minn.—also makers of "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-Slip Surfacing, "3M" Abrasives, "3M" Adhesives. General Export: Minnesota Mining & Mfg. Co., International Division, 270 Park Avenue, New York 17, N. Y. In Canada: Canadian Minnesota Mining & Mfg. Co., Ltd., London, Ont.



Circuit Protector Features Magnetic Action

(17) Murray Mfg. Corp., 1250 Atlantic Ave., Brooklyn 16, N. Y.

This 12-breaker circuit protector, featuring magnetic action in each breaker, has been added to the manufacturer's line of 2-, 6- and 8-circuit protectors. The magnetic action is claimed to make it impossible for the breakers to trip because of external or internal heat. The breakers never need derating, according to the announcement.

The standard package consists of four 15-amp breakers plus two 20-amp breakers with provision for six additional breakers. Six pairs of handle extensions are supplied.

No main switch is required ahead of the 12- and 8-circuit protectors, provided the number of operating handles is limited to six by use of handle extensions. Individual breakers are interchangeable with other new single-pole individually housed breakers.

(18) HOME HEATERS—A new line of floor-model heating units using the double action heating principle is available from Westinghouse Electric Corp., Sunnyvale, Calif. Heating is accomplished by continuous circulation of warm air and by radiation of infrared rays. All models operate from 220/240-v polarized outlets; 2-, 3-, 4-kw ratings are available, with respective heat outputs of 6,830, 10,245 and 13,660 Btuh.

(19) TACHOMETER—For motor applications requiring continuous and accurate speed indication, U. S. Electrical Motors Inc., 200 E. Slauson Ave., Los Angeles 54, offers an electric tachometer arrangement. U. S. Varidrive motors are available now with model R-1 tachometer and generator in ratings from ¼ to 50 hp and speeds from 2 to 10,000 rpm.

For more data fill in coupon, page 50

The Only ULTRA HIGH PRESSURE Disconnect Switch

KEARNEY introduces a *Completely Revolutionary Design—*

NO CONTACT SPRINGS

The Exceedingly High Contact Pressure— 20 Times Greater Than Conventional Spring Action Switches—Provides Higher Conductivity—Cooler Operation.

Turn the page for more information about this new Ultra High Pressure Disconnect Switch

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO.

JAMES R. KEARNEY CORPORATION
4224-42 Clayton Avenue, St. Louis 10, Mo.
Canadian Plant: Guelph, Ontario

This NEW KEARNEY

ULTRA HIGH PRESSURE DISCONNECT SWITCH with NO CONTACT SPRINGS!

The Only ULTRA HIGH PRESSURE DISCONNECT SWITCH in the Field Today

The many other advantages provided by the engineering innovations in this switch are set forth in a bulletin. Send today for 6-25.

JAMES R. KEARNEY CORPORATION
4224-42 Clayton Ave., St. Louis 10, Mo.
Canadian Plant: Guelph, Ontario

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO.

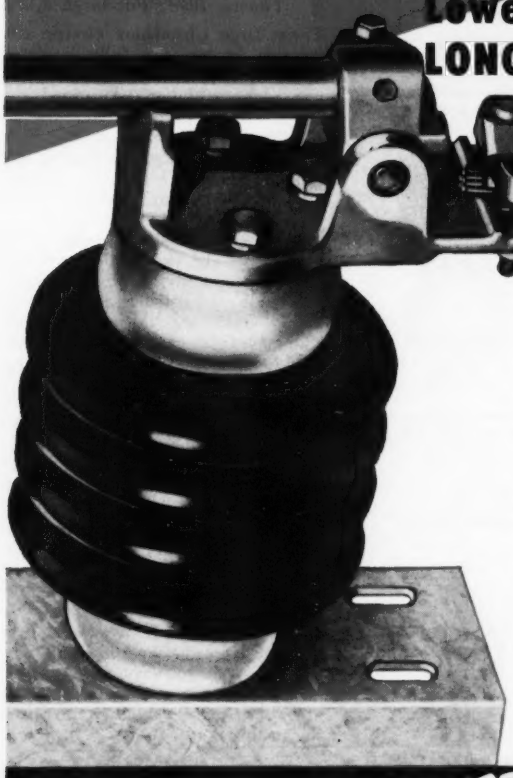
Specify KEARNEY Products . . .

Provides

HIGHER CONTACT PRESSURE

Which Means

HIGHER CONDUCTIVITY
LESS OXIDATION
Lower Operating Temperature
LONGER SERVICE LIFE



There are many advantages in a springless contact switch. Springs, regardless of the metal from which they are made, are subject to fatigue, and their loss of original strength is a steady process. Obviously, a switch depending on spring-supported contact is doomed to a slow continuing loss of conductivity and eventually complete failure. This new switch has no contact springs to wear out. The mechanical advantage supplied by the Toggle Action also provides Positive Ice Breaking ability with little effort exerted by the lineman. The switch in the closed position is locked so tightly together that it is practically one solid conductor completely eliminating radio interference.

West Coast Distributor: MAYDWELL & HARTZELL 176

Better Construction—SAFER Maintenance

NEW!

Rodale announces this new Turn-Tyte line of cord connector bodies that offer you many advantages. Each body consists of two pieces of molded bakelite. The base is armored and contains a cord clamp. The cord hole is .625 and the O.D. is 1¾". Positive heat-free conductivity is assured because all connector bodies and receptacles contain bronze contacts mounted on brass terminals. All metal straps and armor are coated to resist rust and corrosion.

Turn-Tyte

INTERLOCKING DEVICES

Require only a slight turn

Interchangeable with other interlocking devices

Underwriters' Listed

Adequate wiring calls for Rodale's new TURN-TYTE line of interlocking devices. They may be interchanged with other similar makes now in use. All TURN-TYTE devices are manufactured under a quality standard that combines exacting workmanship and the highest quality materials. Available at all leading Electrical Wholesalers. For a catalog and complete details on TURN-TYTE write today to Dept. EH-1.

RODALE MANUFACTURING CO., Inc.

EMMAUS PENNSYLVANIA

2 Wire TURN-TYTE Armored Caps with Cord Clamp

6A—250V — 15A—125V
Dim O.D. 1¾"
Cord Hole .625
Catalog #1026

20A—250V
Dim O.D. 1¾"
Cord Hole .625
Catalog #1226

2 Wire TURN-TYTE Receptacles (Bakelite)

10A—250V — 15A—125V
Catalog #1020

20A—250V
Catalog #1220

3 Wire TURN-TYTE Armored Caps with Cord Clamp

10A—250V — 15A—125V
Dim O.D. 1¾"
Cord Hole .625
Catalog #1036

20A—250V — 10A—575V
Dim O.D. 1¾"
Cord Hole .625
Catalog #1236

3 Wire TURN-TYTE Receptacles (Bakelite)

10A—250V — 15A—125V
Catalog #1075

20A—250V — 10A—575V
Catalog #1275

3 Wire Polarized Armored Cap with Cord Clamp

20A—250V
Dim O.D. 1¾"
Cord Hole .625
Catalog #1201

3 Wire Polarized Single Receptacle (Bakelite)

20A—250V
Catalog #1230

Electric Circulation Heaters

(20) Edwin L. Wiegand Co., Industrial Heating Division, 7540 Thomas Blvd., Pittsburgh 8, Pa.

These large Chromalox electric circulation heaters are fully insulated and have built-in automatic temperature control. The one illustrated is a 40-kw unit for preheating regular fuel oil to approximately 170° F to increase the efficiency of combustion. Similar electric circulation heaters may be used for preheating the stiff, low-cost Bunker C oils.

With higher heat intensities these heaters can be used for Dowtherm, Prestone solutions and heat transfer oils, when connected to large process kettles, tanks or other equipment. The manufacturer states that the same style heaters rated 50, 75 and 100 kw are quickly connected for heating large quantities of water.

The heaters are constructed of heavy steel pipe housings that enclose Chromalox tubular heating elements. The heating elements are alloy sheath for most heating jobs, copper sheath for heating water. Units are completely insulated and baffles are provided in the housing whenever the heater is operated under forced circulation. Thermostats with close temperature control are available, both for the forced-circulation and the natural-convection types. Heavy-duty construction allows them to be operated under relatively high pressures, the manufacturer reports.

For more data fill in coupon, page 50

is your wiring like a camel's back?

ANACONDA "POWER UP" CAMPAIGN HELPS UTILITIES

HERE IS another advertisement in the Anaconda "POWER UP — And Be Prepared" campaign urging industry to make more efficient use of the power it buys from you. This Anaconda campaign is also being directed to contractors and wholesalers.

As in our previous industry-wide campaigns, we again offer advertisement reprints, imprinted with your letterhead and message —for mailing to your industrial power customers.

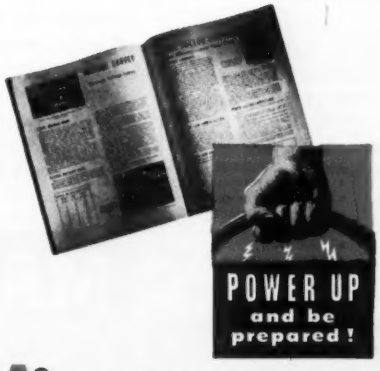
9 out of 10 wiring systems are overloaded

That next piece of equipment you install may be the straw that breaks the back of your plant wiring system—if that wiring is inadequate and obsolete.

Inadequate wiring systems cost money. Every day they're causing cable failures, voltage drops and slowed production in 9 out of every 10 industrial plants. A modern wiring system gives you the full power you pay for . . . and protects you against possible power breakdowns.

Safeguard your production. A strong national defense requires full-scale production and modern up-to-the-minute power wiring systems that can deliver full power.

Make plans to survey your plant wiring system. Call in your utility, plant or consulting engineer or electrical contractor today. And by all means send for your free copy of "*Power Up—And Be Prepared.*" It's a complete guide to modern plant wiring. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.



the right cable for the job **ANACONDA®**

WIRE AND CABLE

Anaconda on the Pacific Coast: *Plant at:* Orange, Calif. *District Offices at:* Los Angeles, Calif.; San Francisco, Calif.; Seattle, Wash.

TYPE C

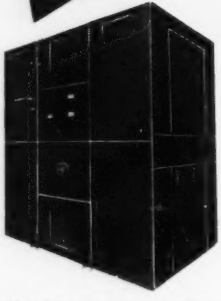
General purpose transformers, 600 volts and below; 1-15 KVA inclusive, single or three phase

HIGH efficiency

MARCUS DRY TYPE transformers

450 KVA, Type F Unit Substation, 4160 V. Delta, 60 Cycles, 3 Ø—120/208Y, 4 wire.

LOW maintenance



1500 KVA, Type F Unit Substation, 4800 V Delta 60 Cy, 3 Ø—120/208Y, 4 wire.

Years of specialization in the dry type transformer field have resulted in a far superior product. Being ahead of the rest of the field is the natural result of continuous effort and research in uncovering new materials which are your constant assurance of maximum transformer value.

MARCUS DRY TYPE, AIR-COOLED TRANSFORMERS

ARE SAFE — No explosion or fire hazards. No fire proof vaults. Class B and C heat proof insulations.

ARE ECONOMICAL — Lower cost installation and operation, negligible maintenance.

For the transformer that's second to none, specify MARCUS.

ONE OF THE WORLD'S LARGEST MANUFACTURERS OF DRY TYPE TRANSFORMERS EXCLUSIVELY

1 to 2,000 KVA up to 15,000 Volts to meet Individual Requirements

- DISTRIBUTION
- GENERAL PURPOSE
- UNIT SUBSTATION
- PHASE CHANGING
- ELECTRIC FURNACE
- RECTIFIER
- WELDING
- MOTOR STARTING
- SPECIAL

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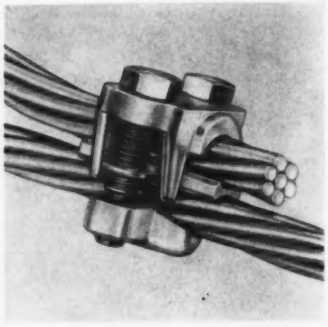
MARCUS TRANSFORMER CO. INC.
40 MONTGOMERY STREET
HILLSIDE 5, NEW JERSEY

PIONEERS IN THE FIELD OF AIR-COOLED TRANSFORMERS



(21) A new spacer-type, 2-bolt connector is being produced in two sizes giving a range from 2/0 to 2/0 in the smaller and 4/0 to 4/0 in the larger, including intermediate conductor sizes. Made by Reliable Electric Co., 3145 Carroll Ave., Chicago 12

Air Circuit Breaker

(22) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

The DB-50 low-voltage air circuit breaker has an interrupting capacity of 50,000 amp. It features a new air-delayed series over-current tripping device, with all elements completely adjustable, providing long-time delay on over loads and instantaneous tripping of fault currents. For use on feeder and back-up breakers, overcurrent trip units including both a long-time and short-time delay element can be specified, providing for selective operation on fault.

The unit is rated at 600 volts a-c, 250 volts d-c; has a continuous rating of 100 to 1,600 amp. It can be operated manually or by either d-c solenoid or a-c Rectox solenoid. All parts are removable as complete units.

(23) POWER SUPPLY — Kepco model 815 has one regulated B supply, one regulated C supply and one unregulated filament supply. The B supply is continuously variable from 0 to 600 v and delivers from 0 to 200 ma. The C supply is continuously variable from 0 to 150 v and delivers 5 ma. A-c output is 6.3 v, 10 amp, center tapped, unregulated. Made by Kepco Laboratories Inc., 149-14 41st Ave., Flushing, N. Y.

(24) MANHOLE COVER—This counterbalanced vault or manhole cover is opened by inserting a combination key-handle and giving it a half turn. Lifting the cover to its vertical open position is a one-handed job because counterweights, which hold the cover in a protective upright position, ease the load. Made by the E. H. Wachs Co., 1527 N. Dayton St., Chicago 22, Ill.

For more data fill in coupon, page 50

Why splice jumpers at transmission strain points? It takes more time, costs more money, sets up a potential source of trouble. You get nothing good for the added expense!

By using O-B Hi-Lite strain clamps, power cable is easily strung through with the slack jumper a continuous un-cut part of the conductor. Cost of the clamps, themselves, is comparatively low. No equipment other than a common hand wrench is needed for installation. Time is a matter of two or three minutes. Holding power develops the full working strength of the cable and is subject to inspection for this condition throughout the life of the line. And above all, *the conductor is not cut.*

O-B Hi-Lite strain clamps are available in ferrous metal as well as non-magnetic, non-heating alloys. They offer you appreciable savings in over-all construction costs and make possible the modern continuous jumper loop. It will well repay your effort to give the O-B Hi-Lite serious consideration.

Ohio Brass

MANSFIELD - OHIO

4111-H

Illinois Porcelain Insulators ARE BUILT TO LAST...

Installed in 1928
STILL GOING STRONG
"Long Life" Illinois Porcelain Insulators which will provide dependable service for many years to come.

Right: Illinois Pin Type Distribution Line Insulator—one of many styles to meet all requirements.

Below: Typical Illinois Suspension Type Dead End Insulator.

● All Illinois Porcelain Insulators are designed and produced to exacting electrical and mechanical standards — completely tested and inspected to insure against breakdown on the job. This, plus a proved record in countless installations like the one shown above are your assurance of long years of thoroughly dependable service.

WRITE FOR COMPLETE INFORMATION AND PRICES

ILLINOIS ELECTRIC PORCELAIN CO.
MACOMB, ILLINOIS

(25) Tenite-coated hot-line poles are available in diameters of 1¼ to 2½ in. and lengths from 2 to 20 ft; are fitted with attachments and tools. The plastic is said to have good dielectric strength and to have been tested satisfactorily at 75,000 v and higher potential-per-foot for five minutes. These poles are manufactured by James R. Kearney Corp., 4236 Clayton Ave., St. Louis 10, Mo. Extrusion is by K-S-H Plastics Inc., High Ridge, Mo., using Tennessee Eastman Co.'s product, Tenite plastic

(26) **SOLENOID** — In the medium-size range but with power sufficient for larger applications, a solenoid recently put on the market is available in 110, 220 and 440 v, with ⅝ in. maximum stroke and rated pull or push ranging from 4 to 10 lb against gravity. Made by Practical Electric Co., Dept. Z, 4505 Oakwood Blvd., Melvindale, Mich.

(27) **SPEED REDUCERS**—New type DB double-reduction speed reducers in ratings from 1 to 100 hp are available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. They are designed for applications on small- to medium-size drives where the prime mover is coupled or belted to the gear unit.

(28) **TIMER** — Industrial Timer Corp., Newark, N. J., is offering a new type multi-cam recycling timer for controlling industrial manufacturing and processing operations. A group of cams, operating snap-action switches, is mounted on a single shaft driven by a synchronous motor. Thus all cams rotate simultaneously and continuously repeat a constant time cycle that is common to all circuits.

(29) **RECORDERS**—A new line of recording voltmeters and ammeters, identified as Series 500, has been announced by the Bristol Co., Waterbury 20, Conn. These instruments make a continuous record of voltages or current on an 8-in. circular chart, similar to previous models.

(30) **PLATING UNIT** — Model A-50 Chromaster is a new unit in Ward Leonard's line of industrial hard chrome plating units. It is used in combination with Chromasol solution. With three minutes plating time, average life of cutting tools and wear parts can be increased two to ten times, it is stated. Details from Ward Leonard, Industrial Chrome Division, 48 South St., Mount Vernon, N. Y.

Test after Test

has proved the PENN-TAP'S

Unequalled Strength

No other fitting of this type has matched the Penn-Tap in tensile strength, in numerous tests to destruction. The reason is obvious:

The Penn-Tap is more sturdily constructed . . . exceptionally tough silicon bronze alloy and ***more of it*** (at no added cost).

For taps, service entrance connections, dead ends . . . indoor or out. Quickly installed with ordinary wrench.

ONE PIECE—no loose parts . . . swivels on one locked bolt. Holds tight permanently. 7 sizes, for cables 10 Str. to 1,000 MCM.

Only one other Split Bolt Connector can take as high clamping pressures as PENN-UNION

Hundreds of competitive torque tests, of Penn-Union Split Bolt Connectors against other fittings of this type, have shown:

The Penn-Union Connector is *definitely stronger than all others except one, which closely follows Penn-Union design and is nearly equal.*

Excepting this one similar fitting, the Penn-Union Connector withstands clamping pressures 15% to 55% higher.

MAKE THESE TESTS YOURSELF. We will gladly furnish sample Penn-Union Connectors for tests against any other make. *Just tell us the sizes you are using.*

PENN-UNION ELECTRIC CORPORATION, ERIE, PA.

Kenneth Anderson Co.	Northwestern Agencies	F. M. Nicholas Co.
412 Seaton St.	4130 First Ave. South	140 Spear St.
Los Angeles	Seattle, Washington	San Francisco

The *Complete* LINE OF CONDUCTOR FITTINGS

PENN-UNION

SAVE HOURS ON
CONDUIT AND PIPE
INSTALLATIONS

...with a GREENLEE PIPE BENDER

Cut costs, speed your jobs this efficient, easy, economical way. Make "on the job" bends in pipe and rigid conduit up to 5", thin-wall conduit and tubing with a GREENLEE Hydraulic Bender. One man operated for fast, accurate, uniform bending. Simple to operate, easy to set up and shift from job to job. Not only saves labor, but eliminates cost of many manufactured bends and fittings. Often pays for itself on first few jobs. Write today for free folder No. E-201.

TOOLS FOR CRAFTSMEN
GREENLEE

Other GREENLEE timesaving tools for industry: Hand Benders for Tubing • Hydraulic Pipe Pushers Knockout Tools • Auger Bits and Drills • Spiral Screw Drivers • Chisels and Gouges • And many others. Greenlee Tool Co., 1767 Columbia Ave., Rockford, Ill.

BULLETINS ETC.

(31) INSULATOR COATINGS—Data on Insulcone, a silicone-base fluid for treating insulators to improve operation in contaminated areas, have been released by Locke Inc., Baltimore, Md.

(32) INDUSTRIAL LIGHTING — A 16-page lighting-at-work booklet is available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. This B-4747 bulletin is aimed at the industrial plant operator, stresses ways that better lighting can work for him.

(33) RECORDER—A 4-page, 2-color bulletin, MPC-1, on its new Multipoint Capacileg, strip chart recorder, has been released by Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

(34) CIRCUIT BREAKER RECLOSING — Type MT-3 circuit breaker reclosing equipment is described in a recent data sheet from Pacific Electric Mfg. Corp., 5815 3rd St., San Francisco 24, Calif.

(35) OIL CIRCUIT BREAKERS—Another recent Pacific Electric Mfg. Corp. bulletin, catalog 548, describes types JE-30 and JE-37 frame-mounted oil circuit breakers.

(36) TRANSFORMERS—A 32-page bulletin on current, potential and metering transformers has been issued by Standard Transformer Co., Warren, Ohio.

(37) LIGHT FOR DRAFTING—Production for national mobilization begins in the drafting room, according to an 8-page bulletin offered by General Electric Co. This lighting guide uses drawings and photographs to illustrate proper lighting for straight edges and shiny surfaces, proper positioning of drafting boards, and recommended types of lighting systems for better drafting. The guide is available from the Inquiry Bureau, G-E, Nela Park, Cleveland 12, Ohio.

(38) CATALOG—A manual containing illustrations, catalog numbers, prices and weights of the complete line of O.Z. electrical fittings is available from that manufacturer at 262 Bond St., Brooklyn, N. Y.

(39) MOTORS—Construction and ratings of totally enclosed, fan-cooled motors with tube-type, air-to-air heat exchangers are described in a bulletin from Allis-Chalmers Mfg. Co., 939 S. 70th St., Milwaukee, Wis.

(40) Computors—A manual on GAP/R high-speed all-electronic analog computors for research and design has been released by George A. Philbrick Researches Inc., 230 Congress St., Boston 10, Mass.

(41) BALLASTS—A series of handbooks for the fluorescent fixture manufacturer are offered by the Precision Mfg. Co., 210 N. Ogden Ave., Chicago, Ill. Covered are ballast testing, fixture and ballast noises and costs of making ballasts.

(42) INSULATING MATERIAL—Class H insulation data have been issued in a new and more convenient form by Irvington Varnish & Insulator Co., Irvington 11, N. J. The new bulletin gives electrical and mechanical properties, standard thickness, lengths and widths and suggested fields of application for silicone saturated and silicone coated asbestos; silicone rubber-coated Fiberglas; silastic tape; silicone varnished Fiberglas, and glass mica.

ELECTRICAL WEST
68 Post St., San Francisco 4, Calif.

Not good after September 1

Please send me, without obligation, the new product information or catalogs described on the following pages and identified by numbers circled below:

1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36	37	38	39	40	41	42

Advertising on page.... ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

NAME..... TITLE.....

COMPANY*.....

ADDRESS.....

CITY..... STATE.....

* Please include your company's name and your position, since we cannot ask manufacturers to furnish literature unless you do.

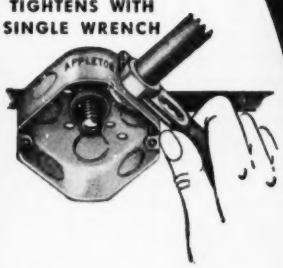
A More Economical Connector...

Here is a ½", ¾" or 1" thin-wall connector that costs less, installs faster, provides extra wiring room. Eliminates locknuts. Knurled chamfer bites the rim of the knockout to prevent slippage and provide perfect grounding. *Write for Price Sheet TNI-351.*

A More Efficient Lighting Fixture...

New "V-51" Series. Never before a vaportight lighting fixture so safe, so efficient, so easy to maintain! Exclusive Unit Assembly makes receptacle, globe and guard instantly detachable for re-lamping, *without tools!* Converts for higher or lower wattage lamps just as easily. Reflector has exclusive neoprene rubber ring mount. *Write for Bulletin 5-A.*

TIGHTENS WITH SINGLE WRENCH



APPLETON ENGINEERING, geared to the ever-growing electrical industry, is continually at work to bring you new products - better products - such as the four recent examples shown here...

A Simpler, Stronger Entrance Fitting...

Appleton OF-1 and OF-2 Service Entrance Fittings combine convenience, economy and greater weather protection. Single-piece bodies eliminate need for separate cover on entrance head. No covers to become lost before installation, loosen or dislodge after job is done. *Write for Price Sheet TNI-351.*

A Much Safer Fixture Hanger Cover...

Positive protection against falling! Safety clips automatically position directly above outlet box ears. Permanently joined to the cover, clips will support weight of fixture even if outlet box screws rust through or vibrate out! An exclusive Appleton safety feature. *Write for Price Sheet TNI-551.*

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ELECTRA'S HUSBAND

Little Grudges Twist the Course of History

HOW many times, I wonder, has a little grudge been taken out on humanity generally for years and years after the initial hurt has been forgotten?

A note in a recent association bulletin led us to this interesting speculation. It said that a government price regulation for the construction industry was lying on the OPS lawyer's desk. And it would probably lie there a good long time. This attorney had a house built for him not long ago. The builder gave him a rough time. Probably threw a lot of extras at him. The attorney was sour on the whole construction industry. He would probably take his own good time to process that order just because of his personal pique over his own unfortunate experience.

Well, history is full of cases in which personal ego has acted as a drive force toward some goal of power. But how many cases there must be where some small irritation has caused a mutation in the course of history started by someone's petty revenge.

Electra and I started to speculate: What made Franklin Roosevelt take out after the power companies, for one? Was it some minor insult by a snappy telephone operator or surly meter reader? Or did some district manager dun his lordship to make him pay an overdue bill? Whatever it was he obviously never forgot it. He took his revenge on the entire industry, good or bad. To gratify his own vengeance he pushed the United States a long way down the road to socialism.

How about Honest Harold Ickes? How honest was his antagonism to the electric power industry? Of course, once he started a fight it was only natural that the industry fought him back. But what started his grudge? Was he indignant because one of the Insulls ignored or high-hatted him? They did that to a good many people. I remember Martin Insull at the San Francisco NELA convention. What a stuffed shirt!

Instead of analyzing the reason for his own gripe and dismissing it, did Ickes take it out on all light and power people, most of whom never high-hatted anybody?

What makes a union organizer? Is it a worker who thinks he has had a "raw deal" from the boss? Does he turn to the union mechanism as a tool to work out his revenge by rising to power in it and then using his position to drive a hard bargain? Is his interest really for his fellow workers or in sipping the intense satisfaction of being able to shut down the entire business?

"Remember that young college lad we knew," I reminded Electra, "who grew up neglected by his dad. He didn't take it out on him. The dad died. But he is taking it out on society and the boss by being an antagonistic labor leader now."

"Yes," said Electra, "there's that radio commentator we hear mornings. Seems to me he used to be critical of the war policy of the administration. Yet now he excuses and rationalizes it all. He thinks he is reporting 'objectively' this MacArthur debate, but he doesn't like Mac a bit. Did he get the brush off when he was in Japan not long ago with his little recording machine getting personal interviews? I seem to remember he did not get one from MacArthur. Could he be venting his displeasure over that now?"

The Russians all act like people with an ingrown grouch—those at United Nations anyway. Probably nurse grudges, like Stalin, from the days they were jailed for their ideas or their sabotage. Now with the tables turned they are taking out their anger on the world. Hitler was another such.

"Now that we are thinking along this line," I recalled to Electra, "it reminds me of a conversation I had with a man with a minor executive job with one of the power companies. He was nobody's fool. This was just before the election that put Roosevelt in for the first time.

"'A lot of people in this company,' I remember him telling me, 'are not going to vote for Hoover. They don't let on to the brass upstairs but they will vote for Roosevelt as a sort of protest. They've lost confidence in the way management is handling things in this depression, particularly things that affect them personally.

"'They know the company is against Roosevelt because of his attitude on public power, but they want to get in a slap at the bosses here in the only way they think they can. You can't reason it. It doesn't make sense in the long pull. But what chance has sense to a person whose feelings are hurt?'"

"Come to think of it, what a lot of gripes go into the polling booth with the voters! How many people vote their peeves out of their system instead of their considered opinion, arrived at thoughtfully? Not many seem to vote with their brains—only with their emotions.

"But what's so strange about that? Hasn't it always been so? All that reasoning or ideology, if you like that word for it, amount to, are clothes in which to conceal naked, primitive ambitions, urges, or angers, to disguise their uglier aspects. Couldn't this be why the party line changes from time to time as the drive takes a new direction?"

It evidently was a mistake to muse this aloud to Electra, for it set in motion some elemental urges in her.

"Yes," she said with finality. "That's what I'm always telling you. You never know what people are going to do. Take me for example. You *never* seem to know when I want a new dress, do you now?"

"Oh yes, I do. You can't catch me on that one. Always."

If you think I had the last word, *you* do not know people either.

Sentiments of many a one of us are expressed in these verses from Provo contractor Howard Dudrey:

To back order I won't even try
For anything I want to buy.
They may have their own cares,
But I'm not buying for my heirs.
Anything I order must arrive
While I, myself, am still alive.

And that seems to go with and without DOs, CMPs and any old CPR.

TAP CHANGER Operated Above Oil Level

NOW STANDARD

ALLIS-CHALMERS
DISTRIBUTION TRANSFORMERS

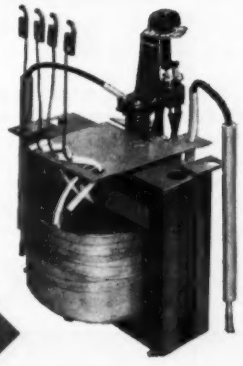
THIS NEW tap changer has its operating handle and indicating dial plate extended *above the hot oil level* for convenience in changing taps. It's easy to operate, easy to read and requires no maintenance. Attractive and compact, the design is based on the sturdy construction features that have given Allis-Chalmers tap changers top performance for many years.

Bold white letters mark tap positions on a black vulcanized fiber dial plate. Cautioning area indicates the location of limiting stops.

As the molded plastic assembly is turned, the high pressure contact snaps into position with a wiping action. The contact shoe is V-shaped so that it makes a positive stop in a position bridging two studs.

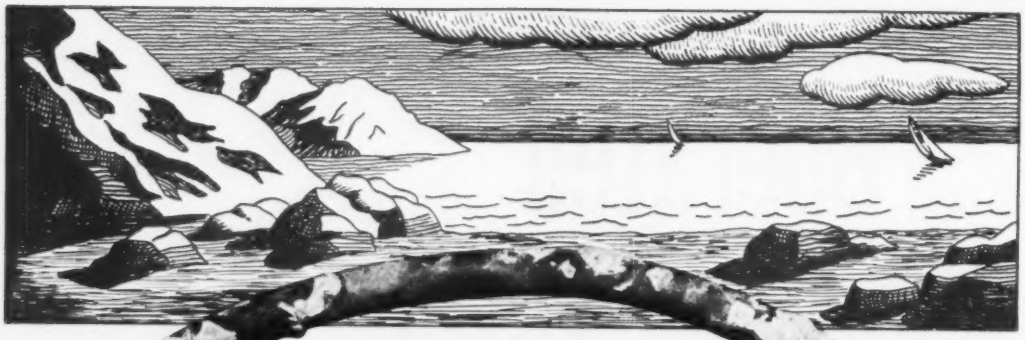
You can get Allis-Chalmers *new* long handled internally operated tap changer in distribution transformers rated 100 kva and smaller single phase; 150 kva and smaller three phase. For more information contact your local Allis-Chalmers sales office or write Allis-Chalmers, Milwaukee 1, Wis.

A-3439



Leads are firmly crimped to tap changer studs for a lifetime connection.

ALLIS-CHALMERS A-C ALLIS-CHALMERS



NEITHER SURF, NOR ROCKS, NOR BARNACLES....

This "beat-up" looking piece of TIREX Cord is a veteran of many battles with the sea. Here's an excerpt from a field report describing its performance.

> "TIREX Cords and Cables have been found to be the only product that can be counted upon to withstand consistently the severe abuse to which they subject cables in their research work. One instance was given: A TIREX Cord led from a heavy instrument located on the ocean bottom several hundred yards from the shore, through the surf and over a rocky water line to the point where they were taking readings. After an unexpected storm they found this heavy instrument cast far up on the beach with the cord still attached, but in a tangled mass. The instrument was a total loss but the cord was intact and was used again on many subsequent occasions without requiring repair."

Isn't that the kind of service you want from your portable cords and cables? Of course it is! You can be sure to get it if you specify and be sure you get Simplex-TIREX Cords and Cables. They're a product of Simplex Research.

Simplex Research gave you the first heavy duty, rubber-jacketed portable cord or cable; the first low water absorption insulation; the first rubber-jacketed underground cable. Besides these notable "Firsts" Simplex Research has provided a great many developments which have enriched the art of cable design.

TIREX is not made nor recommended to be used under water. However, the spectacular life of this TIREX Cord illustrates perfectly the inherent ruggedness of TIREX. This ruggedness has been deliberately built into all TIREX Cords and Cables. It is one of the "plus values" that you get when you use TIREX.

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SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

JULY 1951 Vol. 107, No. 1

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

Critics say that Bonneville exceeded its contract authority in buying these scarce materials and storing them at Meacham, Ore.

Another Controversial Transmission Line

McNary-LaGrande 230-kv federal line is held to be entirely unnecessary. Bonneville Power Administration is criticized for exceeding contract authority in purchase of materials

Building of the 73-mile McNary-Pendleton-La Grande 230-kv federal transmission line at this time is a sheer waste of critical materials and taxpayers' money, say critics. Last year the Bonneville Power Administration received authorization to spend $3,-331,000 for this line and an appropriation of $1,094,000 was made for fiscal year 1951. This year's appropriations bill contains another item of $1,531,000 for this line.

Building of the line has been protested from the time it was first proposed several years ago on the grounds that it is unnecessary and a waste of taxpayers' money. Vigorous protest has been made again this year in testimony before the appropriations committee. The protest includes as well arguments against a new proposal to extend the line from La Grande to Baker, Ore., a distance of 48 miles. Cost of this extension is given as $2,-140,000, and an initial request is made for $54,000 in FY 1952 appropriations bill now pending.

Those opposed to the McNary-La Grande line reiterate that it is unnecessary, a waste of taxpayers' money, and an unwarranted use of critical materials. They point to three large material stockpiles at Meacham, Mission and Stanfield, Ore., on the route of the line. These contain large quantities of poles, insulators and ACSR conductors estimated to be worth around $2 million. (The material dump at Meacham is shown in the accompanying photographs.)

Critics say that quantities of scarce materials under allocation have been tied up in storage here for months to build a nonessential line, when other public agencies and private utilities are suffering from shortages of these same materials, and when Bonneville itself is behind schedule in building admittedly *essential* transmission lines in the Northwest.

It does not look good for the government itself to be "hoarding" critical materials while at the same time it is imposing restrictions on industry, say the critics. They also ask an ex-

planation of the Bonneville Power Administration for buying materials obviously greatly in excess of the contract authority of $326,000 granted them for this line as provided in the FY 1951 appropriations bill. They also ask for the same reason how Bonneville came to award a contract to the Power City Electric Co. of Spokane in mid-April of this year for $356,531 for building the McNary-La Grande line.

Opposition Testimony

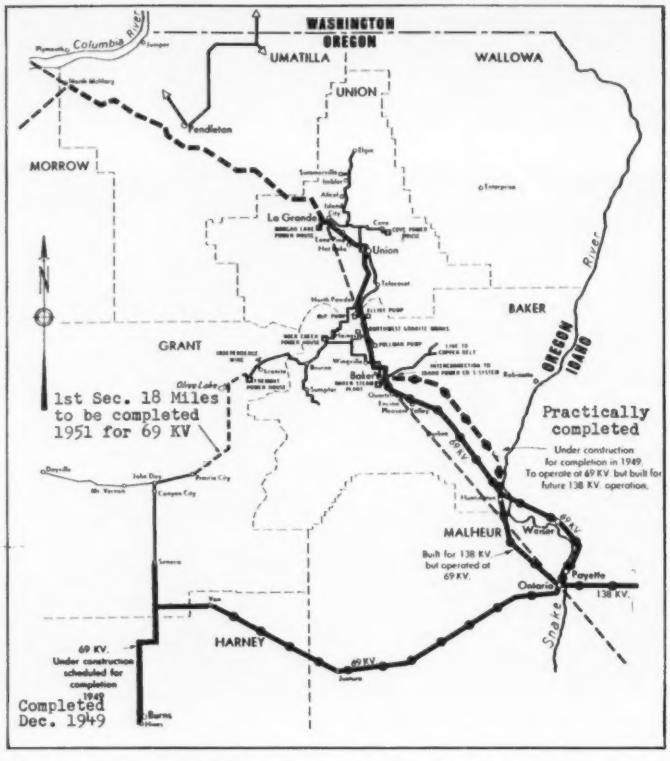
In testifying before the appropriations committee recently, Elmer E. Kime, vice-president of the California-Pacific Utilities Co., serving an area in eastern Oregon, had the following to say concerning the McNary-Pendleton-La Grande-Baker line:

"I am here for a twofold purpose: First, to request your re-examination of the McNary-La Grande 230-kv transmission line for which Bonneville is requesting $1,531,000 this year; and, second, to oppose the $54,000 request for surveying the Baker-La Grande line (see map) which, if authorized, may lead to an ultimate additional federal expenditure of $2,140,000.

"I cannot understand how these transmission lines reach their present status without the people in the hinterlands being informed about Bonneville's intentions. For instance, we only learned about the Baker-La Grande proposal accidentally from a newspaper item a week before it was presented to the House Appropriations Committee.

"The McNary-La Grande line, Item 23, is estimated to cost $3,331,000. This is specified as a 230-kv line, and it is stated that the line will relieve an imminent power shortage in Union, Baker and eastern Grant counties of Oregon. Actually, in January 1951 the Union County peak load was 7,900 kw. Reputable engineers advise me that the carrying capacity of the proposed $3½ million line is about 250,000 kw or 30 times present peak. I sincerely submit, gentlemen, that Bonneville has no electric power to transport into our area but instead we, east of the Cascades, collectively, transmitted 105,000 kw into the Northwest Power Pool in January of this year.

"Furthermore, we have never refused service to anyone in our four-county service area, but instead have expanded our service at an almost unbelievable rate. We expect to accomplish practically 100% farm coverage this year and also add about 3,000 kw of new load. I, therefore, respectfully request your reconsideration of Bonneville's plans to construct this huge capacity 230-kv line into an area adequately served, where no power shortage has ever existed, and where the Bonneville administrator has no customer and because he will have no power available, according to his own statements, until 1954. Incidentally, the McNary-La Grande line will require almost two million pounds of critical materials.

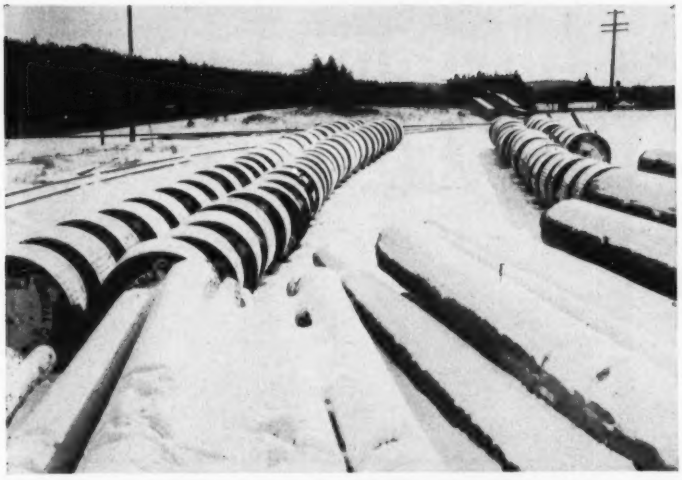


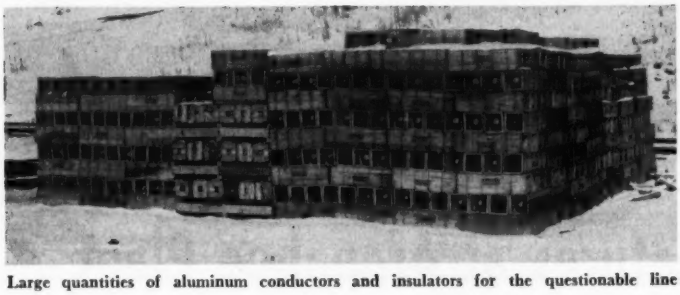
This map shows route of McNary-La Grande 230-kv transmission line in question

"The second request, the La Grande-Baker line, Bonneville Item I-24, I believe shows better than any other illustration to come to my attention the fallacious justifications being presented to this honorable committee. The La Grande line, Item I-23, is justified to relieve power shortages in Union, Baker and Grant counties, and the very next Item, I-24, is justified to permit scraping the barrel and hauling excess power away from our area. We believe the proposed lines with their tremendous capacities will not benefit the economy of eastern Oregon but will instead penalize and remove forever the future potential of the natural resources which are rightfully ours and which we will develop if given the right to do so."

Bonneville has worked assiduously for nine years to build the La Grande line. First the line was to serve a prospective People's Utility District at La Grande. To this day, this Union County PUD owns no property nor has it secured necessary voter authority to finance purchase of the existing facilities. Critics say that Bonneville's original request for funds was typical of tactics being used at that time to further the public power movement—that is, to build transmission lines in advance of specific needs and then continue to whip up sentiment for the creation of PUDs.

Opponents contend that Bonneville's real motive in wanting to build this line, and extension to Baker, is: (1) to extend the domain of public power in eastern Oregon and be within striking distance of the southern Idaho territory of the Idaho Power Co.; (2) to be ready in anticipation of USBR approval to build Hell's Canyon; and (3) to establish another link in a backbone transmission grid connecting the several major federal power projects of the West. As further confirmation, critics cite the recent naming of BPA as marketing agency for southern





Large quantities of aluminum conductors and insulators for the questionable line

Idaho by the Secretary of the Interior.

"Potential" or "impending" power shortage, or "power-short area" are phrases frequently used by Interior department agencies to justify proposals or even actions. Implication that there is a pending or actual power shortage in either the territory served by the California-Pacific Utilities or the Idaho Power Co. is at variance with the facts. The former has a contract with Idaho Power to supply all future power needs. Idaho Power has a second transmission line under construction to carry out terms of this agreement. This line is completed with the exception of several short gaps across public lands where the Department of Lands has refused to grant a right of way except on the condition that Idaho Power agree to wheel federal power.

Idaho Power has ample power reserves and is adding to its generating capacity. It has done an outstanding job in power development for years and particularly during the postwar period. As a matter of interest, this private utility's surplus power finds its way via the Northwest Power Pool to relieve power-short Washington and western Oregon where the federal government has pre-empted power supply.

Methods Questioned

Few critics question the wisdom of spending the people's money for large multipurpose river developments where benefits are regional and even national in scope. Nor is there much objection raised to the government building the essential transmission lines to transport the power to markets. What critics do object to is the waste of taxpayers' money in unnecessary duplication of facilities and the building of lines into territories already adequately served. They object also to the public "preference clause" in marketing federal power, which precludes private power companies from getting any federal power on a firm contract basis.

Experience shows that governmental agencies have taken advantage of this preference clause to further public power and to embarrass the private power companies.

Spokesmen for private power say that it can live with public power if the rules of the game are fair and equitable. Private power companies of the Northwest have absorbed all the federal power made available to them from Bonneville. Facts show that they have passed on to their customers the benefits of their diluted power costs at rates comparable with public power, despite the fact that more than 20% of their gross revenue must go to local, state and federal taxes, and despite the fact that they do pay a reasonable wage on the risk capital on which they operate.

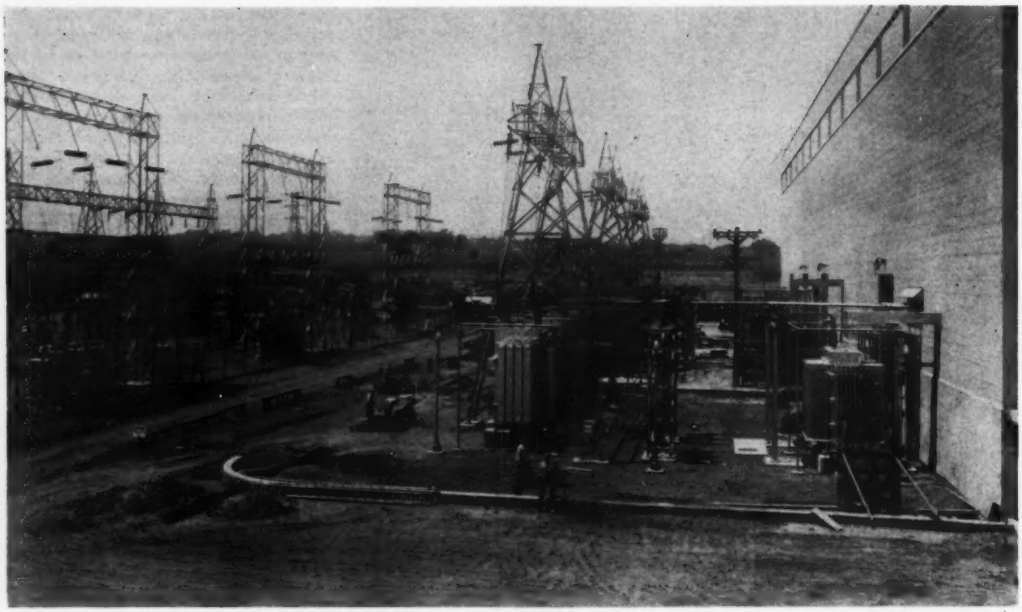
Ask Only a Fair Break

When power has been short in the Northwest necessitating curtailment the private utilities along with the cooperative municipal systems of Seattle, Tacoma and Eugene have taken the brunt of curtailment. Where operation of private and municipal steam plants has been necessary, the private companies have had to absorb the high power costs of these plants. All other utility agencies take the Bonneville power they need under the preference clause.

Another thing that nonfederal members of the pool point out as being inequitable is that all the benefits of diversity in the Northwest Power Pool should accrue to Bonneville. It is agreed among pool members that there is a diversity of at least 500,000 kw by reason of pooling all Northwest power resources. This 500,000 kw at Bonneville's rate of $17.50 a kilowatt-year is worth $7,750,000 annually. It is claimed that Bonneville is selling much power that it does not inherently possess. The contributing utilities are seeking a proportionate share in the benefits of this diversity.

Law Unto Themselves

These controversial transmission lines and practices of agencies of the Department of the Interior are perennial bones of contention to that large segment of the people who stand for fair play, who want to preserve the free enterprise system, and who are opposed to nationalizing the power industry. Critics ask the very obvious and natural question, "why do not the Bonneville Power Administration and the Bureau of Reclamation confine themselves and their activities to the intent of Congress in creating the acts under which they exist, instead of engaging in politics and propaganda, instead of making interpretations of the Bonneville Act and the Reclamation Act to suit their own purposes, and of virtually taking the law into their own hands?"



Generators at Arapahoe feed directly through 50,000-kva single-phase transfomer banks at generator voltage without oil circuit breakers. No permanent oil handling facilities were provided. Fire protection in the switchyard is provided by water-fog

Electrical Features at Arapahoe Plant

Warren D. Hardaway
Public Service Co. of Colorado

The Arapahoe plant, a 120,000-kw steam-electric generating station, is being built in Denver by the Public Service Co. of Colorado as a major step in its expansion program. The first of the three 40,000-kw units was synchronized Oct. 7, 1950, the second March 16, 1951, with the third scheduled for November of this year.

The basic plant fuel is pulverized Colorado subbituminous coal, with natural gas available during some portions of the year. Steam conditions are 850 lb, 900°, with induced draft-cooling towers for condensing water supply. One 450,000-lb per hour boiler is provided per turbine with no steam cross connections.

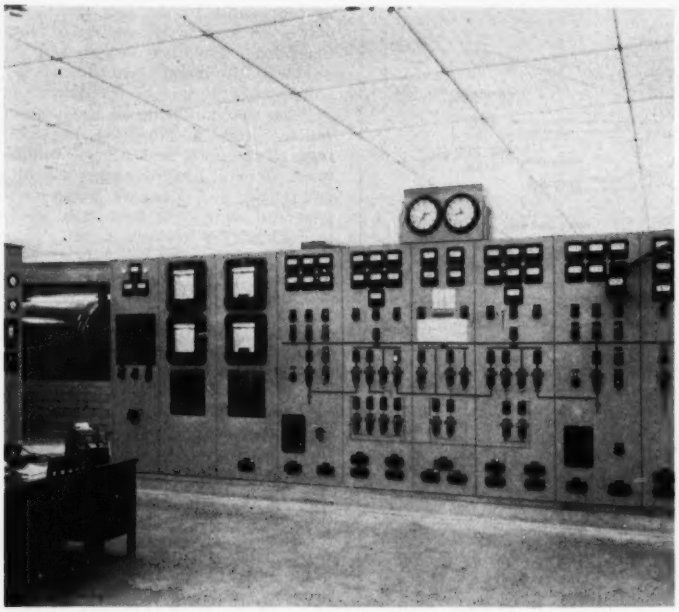
Plant output is fed into the company's 115-kv transmission system over two double-circuit steel tower lines which form a portion of a belt line around the city of Denver.

The plant substation, as shown on the accompanying diagram, has a main and transfer bus with four line oil circuit breakers, three generator breakers and one sectionalizing breaker in the main bus. The generators feed directly through 50,000-kva transformer banks, without circuit breakers, at generator voltage. Each unit has a 6,000-kva, 13,800/2,400-v, 3-phase house power transformer connected to the generator leads. This supplies the auxiliary power requirements of that boiler and turbogenerator. A fourth similar transformer, fed at 13.8 kv from a nearby substation, provides power for auxiliaries common to all units, and start-up and emergency power for any of the units. All important auxiliaries are electrically driven.

Transformers

Main transformer banks consist of three 16,667-kva self-cooled 13.2-kv delta, 63.51/110-kv wye transformers, with the high-voltage neutral solidly grounded. Provision is made for future addition of cooling fans to give these banks a maximum rating of 62,466 kva each. Single-phase transformers were believed economical for the two reasons that a suitable spare was available in the area and that relative ease in handling permitted the omission of transfer tracks or other provisions for moving the transformers from their foundations. In the event of failure, the transformers can be moved with the plant crane, or if moving over longer distances is necessary, low-bed rubber-tired commercial heavy trailers will be used.

Transformer tank covers are welded, and windings are made accessible by removing the tanks, rather than by pulling the cores. To reduce oxidation of the oil, two banks are equipped with gas-oil seal, and the third is hermetically sealed. No permanent oil handling facilities have been provided



This completely louverall ceiling with fluorescent lighting was provided in the Arapahoe steam plant at Denver to avoid reflections on instrument covers and operator discomfort

at the plant as a 4,000-gal tank truck with filters, pumps and oil hose is available in the area.

Both main and auxiliary transformers have water-fog fire protection supplied from city mains, automatically operated by heat-sensitive devices mounted above the transformers.

Control Room

The station arrangement provides a centralized control room and house power room for the first pair of boiler and generator units, with a "half" control room and house power room for the third unit. These rooms are located at the turbine deck level.

Instrument and control panels in the first control room are arranged roughly in a square, with turbine panels at the side, boiler panels in the rear, and the electrical panels in the front, all facing the center of the room. All of the electrical controls are in this room with only the turbine and boiler panels for the third unit in the half room. Electrical controls are handled under despatchers' direction by the shift operator who is also responsible for turbine and boiler operation. To simplify his work, voltage regulators, frequency control, telemetered total load and temperature recorders are provided.

In addition to generator winding and gas temperatures, main and auxiliary transformer temperatures are recorded. Operators are thereby relieved of hourly patrol of the substation. Movement of disconnecting switches or other work in the switch yard is accomplished by calling men from the electrical maintenance pool in the city. This crew also handles all of the plant electrical maintenance, with no electricians regularly stationed at the plant.

The ceiling and a portion of the side walls of the control room are acoustically treated, and windows into the turbine hall are fitted with double glass, which has resulted in a comfortable sound level. A combination of fluorescent and incandescent lighting is used, above an egg-crate or louverall ceiling, as shown. This has avoided disagreeable reflections from the meter and instrument glass covers. Switches are provided which control the fluorescent and incandescent lamp units in various stages, so that the men on shift can adjust the illumination level in the room to suit their convenience.

Control cables under the control and house power rooms are carried in open expanded metal cable trays. Access to the trays for construction and maintenance is from steel grating walkways.

The auxiliary power room for each pair of units is located between the boilers, just back of and at the same level as the control room, very near to the "center of gravity" of the load served, permitting short runs for both power and control cables.

Twenty-four hundred-volt bus duct connects the outdoor oil insulated auxiliary transformers with the unit 2,400-v metal clad buses and air switchgear in the house power room. Motors 250-hp and larger are supplied directly from this bus through oil-base insulated cables in conduit. Each unit 2,400-v bus also supplies an outdoor cooling tower center consisting of a 500-kva oil insulated transformer throat connected to 480-v switchgear for the two-speed reversible cooling tower fan motors.

Dry type 2,400/480-v, 1,000-kva transformers in the house power room, close coupled to draw-out switchgear, supply motors of moderate horsepower directly, and the smaller motors through feeders to control centers located conveniently about the plant. The 60-cell, 560-amp hr station control battery and charging set are also located in the house power room.

Building and yard lighting is supplied from 480/120-v dry type transformer and switching cubicles located about the plant. The mid-point of the 120-v winding is grounded with no other provision, such as insulating transformers or reduced voltage outlets for extension cords used in boilers or other wet locations.

In starting up a generating unit, the unit auxiliary bus is manually switched to the common or start-up transformer, then, after the generator has been synchronized, the unit bus is manually switched to its own auxiliary transformer. This operation automatically trips the breaker from the common bus.

Each boiler is equipped with three motor-driven feed pumps, two of which are supplied from the unit auxiliary 2,300-v bus, with the third from the common bus. Loss of voltage on the unit bus automatically starts the pump supplied from the common bus.

In addition to the conventional differential relays, the generators and main transformers are protected by voltage restrained over-current relays, which also give back-up protection for bus or line faults. Differential protection is provided for each section of the main 115-kv bus. Line breakers are equipped with impedance and pilot wire relays, with the pilot channels either leased pair or carrier current.

Ebasco Services Inc. were the engineers and general contractors on the project, and the Collier Electric Co. of Denver installed all electrical equipment on a unit bid subcontract.

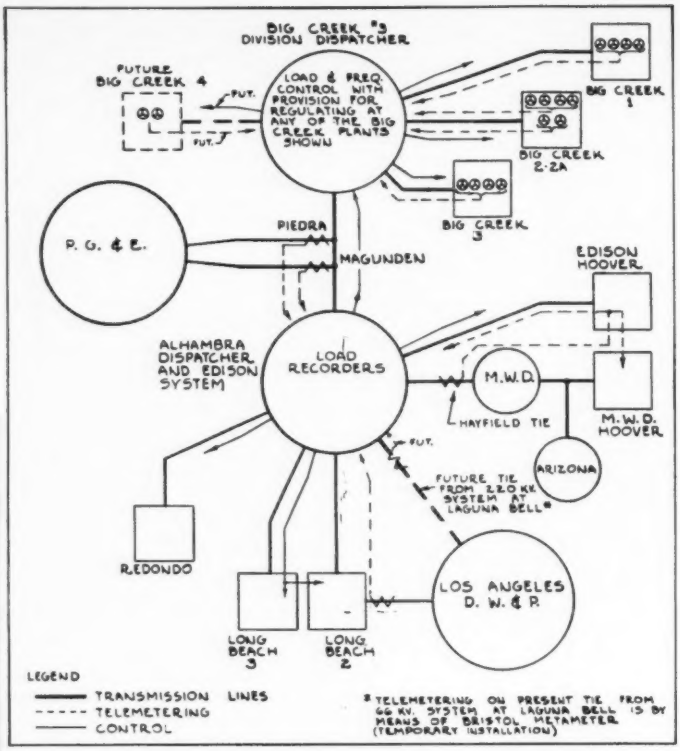


Fig. 1: Interconnections between Edison company and its neighboring utilities

Automatic Tie Line Load Control Solves Power Interchange Problems

C. M. Clevenger and L. E. Ludekens

Southern California Edison Co.

Utilities of the West have long recognized the need for, and the economies that could be effected by, extensive power interchange between systems. Experience has shown that it is impossible to realize the maximum benefits of interconnection without telemetering and automatic tie line load control. Records show that with interchange facilities of the past there was considerable variation in loading on the tie lines between the various California utilities. Causes for these load swings were many. They could be traced not only to the inherent characteristics of the interconnected systems, but also to established operating procedures involved in balancing generation with load requirements. To maintain adequate normal regulation requires almost continuous communication between the interconnection point, dispatching center and regulating plant.

These operating problems have been solved by the Southern California Edison Co. with the recent completion of an extensive installation of automatic tie line load telemetering and control equipment (Fig. 1). This is designed to narrow the band width of load or frequency swings as close as practicable to the inherent band width, to reduce the drifts of the band from scheduled values, and to reduce the number of operations involved in regulation tie line loads.

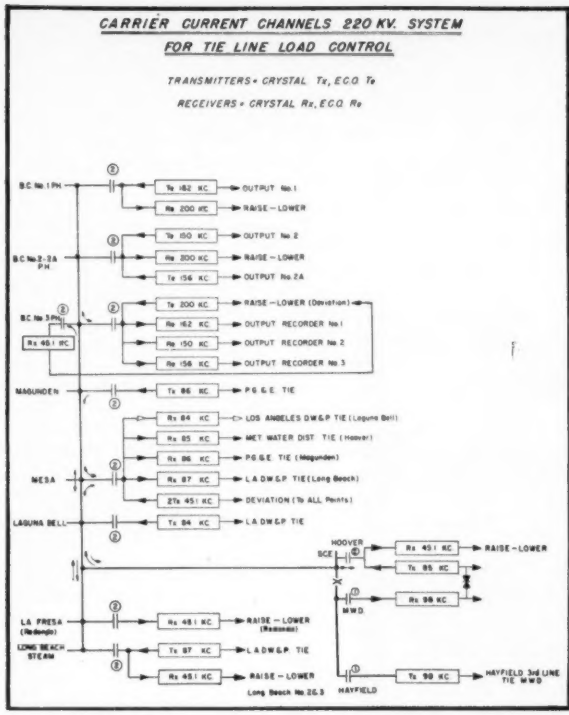
From the standpoint of instrumentation, Leeds & Northrup impulse-type telemetering and control equipment, General Electric carrier current equipment and Lenkurt audio-tone telegraph equipment have been used throughout the installation.

Edison Ties

Extent of interconnections between Edison and its neighboring utilities is shown in Fig. 1. This involves two ties with the Pacific Gas and Electric Co., one at Piedra substation and one at Magunden substation; one tie with the City of Los Angeles, Department of Water and Power, at the Long Beach steam plant; and one tie with the Metropolitan Water District at Hayfield substation. The distance between the Piedra interconnection point and Hoover power house, the primary regulating plant, is approximately 500 miles. Included in the power pool, by reason of the interconnections, are some 6,046 megawatts of generating capacity.

At the tie points where fast response to load changes is imperative, Speedomax transmitting recorders are used. These recorders receive their intelligence from Bristol Thermoverters, which are connected to the tie line instrument transformers and produce a d-c output in millivolts proportional in amount and direction to the a-c power on the tie line. The Speedomax recorders take this millivolt input and convert it to impulses whose length is a function of the load on the tie line. These impulses are used to key the associated carrier equipment, transmitting the values of tie line load to the Edison dispatching center at Alhambra, near Los Angeles.

At the Alhambra dispatching center, the load impulses received from the tie points are recorded on Micromax load recorders, one for each interconnection, showing the actual loads on the tie lines. The dispatcher programs in advance the amount and direction of desired power interchange with the other utilities involved. He then manually sets this value in the Speedomax deviation transmitter, where it is automatically and continuously compared in a bridge circuit with the actual load on the tie line being controlled. Any difference between the actual and scheduled load is then transmitted to all generating locations simultaneously as a deviation, in megawatts, from the desired control point.



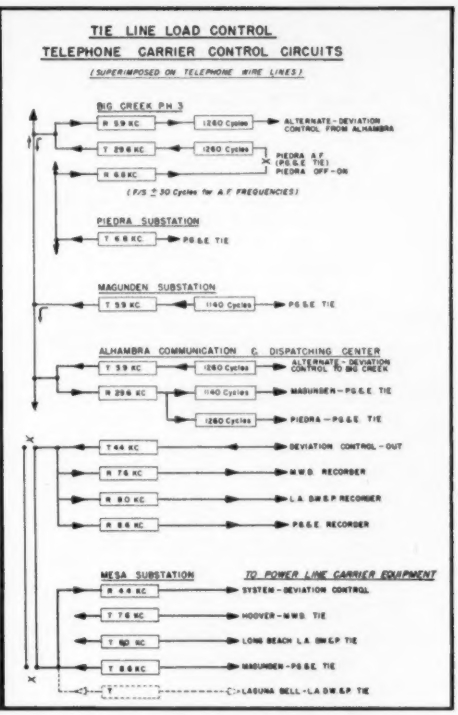


Fig. 2 (left): Power line carrier channels and Fig. 3 (right): Telephone carrier circuits for tie line load control

This deviation signal is an impulse, whose length indicates the amount of departure. This is used to key the associated carrier equipment. The dispatcher designates which generating plant is to regulate for Edison, and instructs that plant to use this deviation information for control purposes, provided that Edison has agreed to regulate the tie line load.

At Hoover power house, Redondo, Long Beach and the Big Creek dispatching center, these load deviation impulses are received from the carrier equipment and recorded on Micromax deviation recorders. The deviation recorder, working with a master load frequency controller, converts the low deviations to *raise* generation impulses, and the high deviations to *lower* generation impulses.

At Hoover, the raise and lower generation impulses are fed to a common control bus. To this any one or all of the three Edison units A5, A6 and A7 may be connected in parallel. Balance of load between units is maintained manually by the operator.

At the Long Beach steam station, the raise and lower generation impulses may be channeled to any one of four units (8R, 9, 10, 11). There is no provision at this location for parallel operation of these units under automatic control.

At the Redondo steam plant, governing impulses are directed to all units by means of proportional load controllers. This is done in such a manner as to maintain automatically a balance of load between units. Thus all units share in the regulation in proportion to their capacity.

In the Big Creek generation area, a second dispatching center is located to coordinate generation in the area. Here, the raise and lower generation impulses are sent by direct wire lines to Big Creek 3. In addition, they are used to key carrier equipment for transmission to Big Creek plants 1, 2, 2A, and 4.

Proportional load controllers, similar to those at Redondo, are used at all Big Creek plants for equal division of load between units. At Big Creek 1, 2 and 2A, where the units have two turbines with separate governors for each generator, it becomes necessary not only to divide the load equally between units but, in addition, to maintain a balance of load between the paired turbines. This is accomplished automatically by a set of filter relays, operated on a basis of relative position of the needle valves.

Because of the diversity of water sources, and in some cases relatively small forebays, no provision has been made to share regulation jointly between plants at Big Creek.

Ernst Norman Laboratories crystal-controlled frequency standards are provided for use in the control of system time error. These instruments are compared to Washington, D. C., standard time signals of station WWV.

In addition to the equipment mentioned for controlling tie line loading, provisions have also been made for controlling system frequency, or a variable combination of load and frequency. These types of control are generally referred to as flat tie line control, flat frequency control, and tie line bias control, respectively.

Control Channels

Control channels were a distinct and separate problem of the tie line load project. With continuous operation as a prerequisite, a study was undertaken to establish a practical method of providing continuous control circuits.

Two basic channel paths (Figs. 2, 3)

were available at all operating points: (1) the 220-kv transmission line grid containing some 1,500 circuit miles of conductor and (2) the private telephone line system of the company. Extensive field tests were conducted using portable variable frequency oscillators and tunable vacuum tube voltmeters.

Fundamental equipment requirements for power line carrier were low power transmitters with stable frequency control, minimum utilization of carrier channel spectrum, no interference to or from existing carrier equipment, and no power line channel trapping or by-passing of line sections. All line coupling to be phase-to-ground.

Equipment found most suited for the power line application was a product of the General Electric Co. The transmitter characteristics are narrow band, crystal controlled, frequency shift and low power. Receiver design features are high gain, narrow band, automatic gain control and limiter circuits using discriminator type detectors.

Telephone carrier equipment is of two basic types: (1) audio tone narrow-band frequency shift channels, superimposed on pilot control channels of stacked carrier voice circuits and (2) narrow-band low-frequency stacked carrier channels. The latter is used on short line channels.

Linkurt Co. telephone line type carrier equipment was found to be best suited for all telephone line control applications.

The first control channel was placed in service during 1947, over the Hayfield-Hoover 220-kv line of the Metropolitan Water District. This particular channel is side-banded to a duplex two-frequency carrier telephone installation.

Mesa substation, approximately six miles from the Alhambra dispatching center, is the power line carrier terminating center. The incoming tie load condition signals are: Hoover retransmission of Metropolitan Water District tie at 85 kc; Magunden substation, near Bakersfield, transmission of Pacific Gas and Electric Co. tie at 86 kc; and Long Beach steam plant transmission of Los Angeles Department of Water & Power tie at 87 kc. A similar circuit for a second tie will be installed in the near future in Laguna Bell substation at 84 kc. These signals are mutually coupled to the same tuning equipment and line capacitor along with the outgoing signal of the deviation control transmitter. The deviation control signal is transmitted simultaneous to the entire 220-kv system. It is received and instrumented at Hoover and Big Creek 3 power houses, also Long Beach and Redondo steam plants. The carrier terminal is located at La Fresa substation for the latter, with a six-mile d-c control line connecting the two stations.

Application of deviation control signal in the form of raise-lower impulses to the governor is by order of the system load dispatcher to a specific station.

The control channels to and from Mesa substation and Alhambra dispatching center are via stacked low-frequency carrier channels over a specially constructed telephone line. Three frequencies are transmitted from Mesa to Alhambra and one from Alhambra to Mesa. An alternate stand-by special telephone line is provided.

A similar telephone line channel is now under construction between Big Creek 3 and the new power house, Big Creek 4. Telephone carrier equipment will be narrow-band frequency shift plus or minus 30 cycles. Big Creek 3 to 4 will have two frequencies—34.460 kc and 34.100 kc. Big Creek 4 to 3 will operate on 26.980 kc.

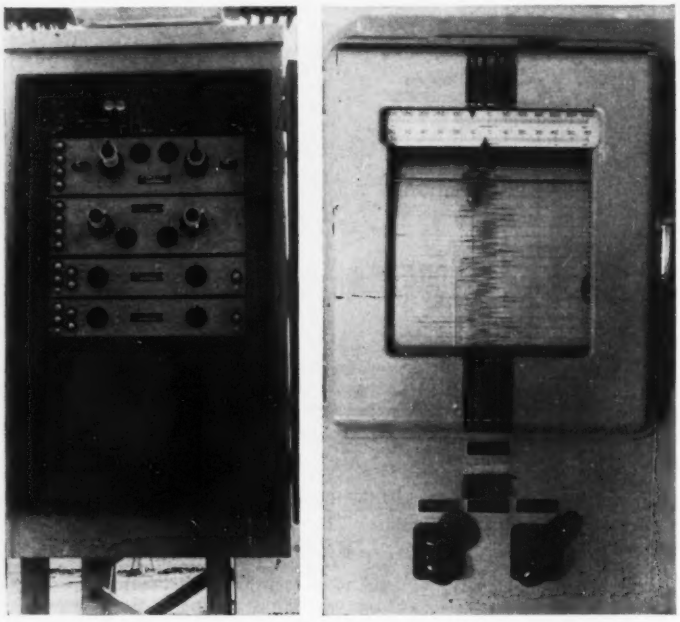
Piedra substation, King's River area, Pacific Gas and Electric Co. tie is via telephone carrier only. This is routed through Big Creek power house 3 and south to the Alhambra dispatcher's board. Magunden-Pacific Gas and Electric tie has an alternate stand-by route via a telephone channel to Alhambra.

In the Big Creek generation area, a second power line carrier channel group was established to care for local instrumentation and control. All carrier frequencies are between 150 kc and 200 kc. Because of the short distances involved, electronic oscillators were substituted for crystal-controlled equipment.

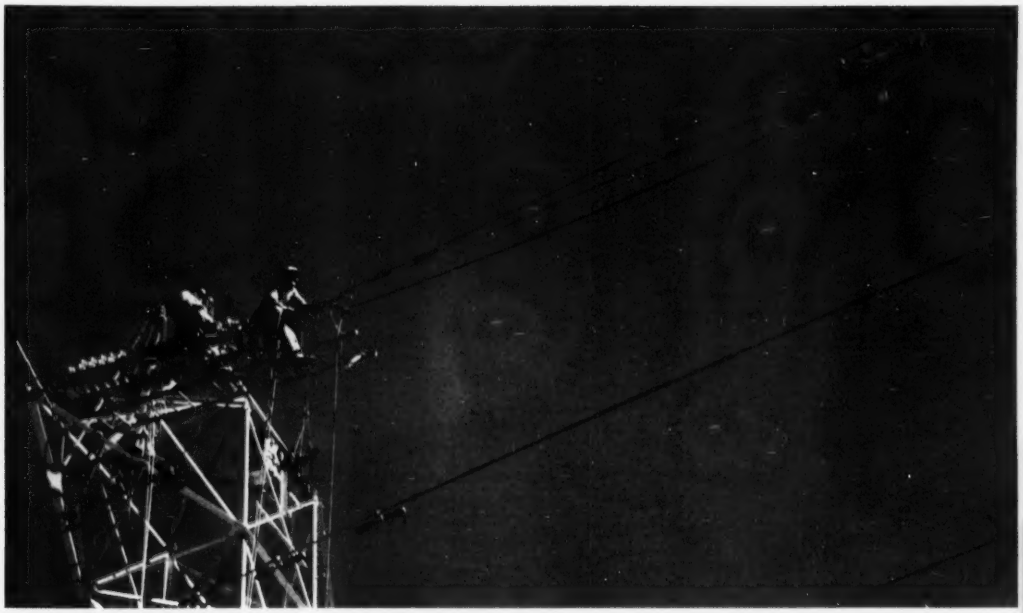
Deviation — raise and lower — impulses are retransmitted at 200 kc simultaneously to all hydro plants. Plant output telemetering is transmitted back to Big Creek 3 dispatcher's board from Big Creek 1 at 162 kc, Big Creek 2 at 150 kc and Big Creek 2A at 156 kc. All in and out carrier channels are mutually coupled through the same capacitor at each station.

Most system power line coupling terminals have duplicate facilities to buses or lines at each station. Remote or manual control transfer switches are provided.

The comprehensive tie line load control system has been completed as planned. Other than a small number of minor technical difficulties to overcome during the progressive installation program the entire program has met with success.



Line tuning unit (left) at Big Creek 1. Short distances made possible substituting electronic oscillators for crystal control. Right: Desired interchange is automatically and continuously maintained by deviation recorder sending out governing impulses



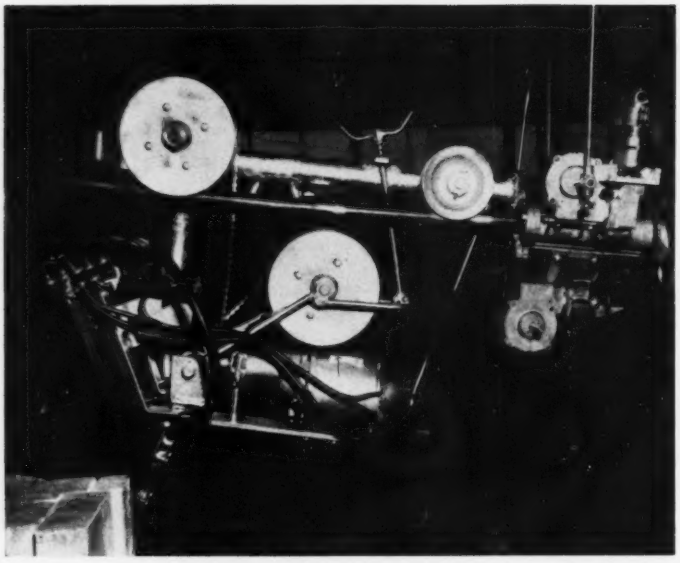
Linemen complete placing the airway light and installing trolley on conductor ready to feed light out to mid-span

Transmission Line Provides Energy to Operate Aircraft Warning Light

Installation trolley has pushed light about half way out on 2,050-ft span

Solution to the problem of providing aircraft warning lights in mid-span of transmission line river crossings appears to have been solved by a new neon light that is operated by energy taken from the line itself. The ingenious idea is a joint development of Washington State College and the Bonneville Power Administration. First experimental installation of the new neon airplane warning light was completed at the Columbia River crossing of a BPA line near Entiat, Wash., May 31. The new safeguard for night flying aircraft may revolutionize transmission line warning lights, in the opinion of Hamer J. Dana, state college experiment station director, and Sol E. Schultz, Bonneville chief engineer.

A successful trial installation of the light on the Spokane-Grand Coulee 115-kv line near Reardan, Wash., May 24, indicated that the neon light cage can be pushed out to the center of a long transmission line span with a special installation trolley without the use of a bosun's chair or other special installation equipment.



Remote control trolley for pushing light assembly out on transmission span

Current to operate the neon tube is supplied by magnetic induction from the transmission line itself, requiring no independent source of power. This is done with a special one-turn primary transformer utilizing the flux set up by the current flowing in the transmission conductor. Special clamps automatically hold the assembly in place on the cable. Life of the neon light is estimated at 50,000 hr or more, or about 70 times the life of the conventional incandescent light.

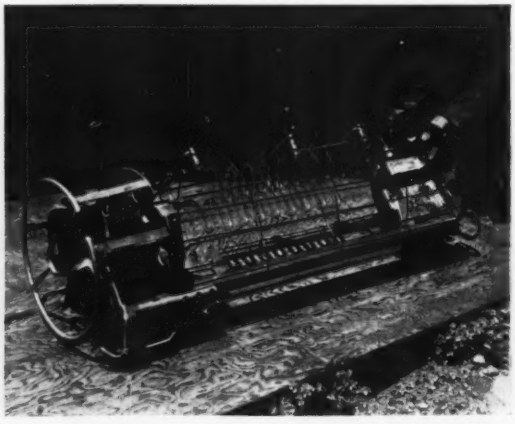
Visibility tests by night flying aircraft conducted at both Reardan and Entiat revealed that the light could be seen at distances ranging from 15 to 19 miles with normal transmission line currents of 250 to 500 amp. The new neon light, spaced at frequent intervals on long river crossings or other hazardous transmission line spans, is expected to be more readily visible than the conventional searchlights shining on the span from the end towers. Lowered cost of maintenance and the independent source of power from the transmission line itself are chief advantages of the new light.

Installation of the light on the 2,050-ft Columbia river crossing span at Entiat involved pushing the light out to mid-span with the special motor-operated trolley and locking it in place. Installation took place from the steel transmission tower at the east side of the river crossing, from where the span rises nearly 800 ft to the tower on the west bank of the river.

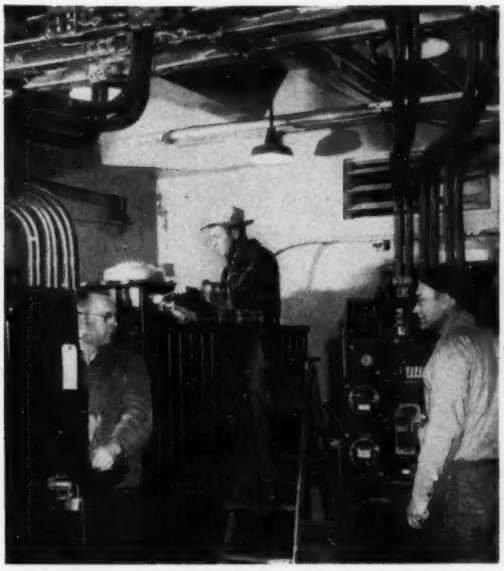
A cylindrical cage about 3 ft long and 1 ft in diameter, constructed of aluminum rod, holds two 24-in. continuous "S" curved neon tubes wired in parallel, and a transformer. Wired in parallel, only one of the tubes burns. When it fails the other tube automatically lights, doubling the life of the unit.

The special power-driven installation trolley is expected to reduce greatly installation and maintenance costs. Coupled to one of the neon light assemblies, the power trolley propels itself along the conductor by rubber lined pulleys to any point in the span. Remote controls then cause the trolley to clamp the light fixture in place, uncouple itself and return to the tower. Thus the tedious installation involved in the conventional use of a lineman riding a bosun's chair out on the cable is obviated.

Work on developing improved airway safety lights for dangerous transmission line crossings and towers has been carried out in cooperation with the Civil Aeronautics Administration since 1946, to meet growing air traffic and the increasing speed factor of jet planes. Eventual replacement of present costly incandescent river crossing searchlights and tower lights with the new neon tube development is planned by Bonneville if commercial operation proves out the success of the trial installations. Plans call for initial installation of over 100 of the new neon lights on the system.



Two views of neon airway warning light that takes its power by induction from the 230-kv transmission line itself

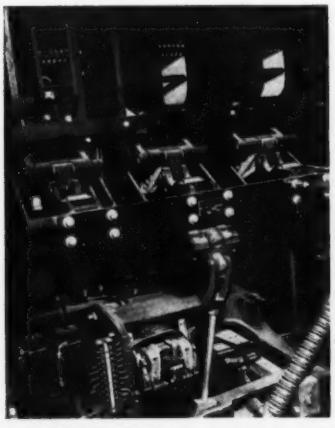


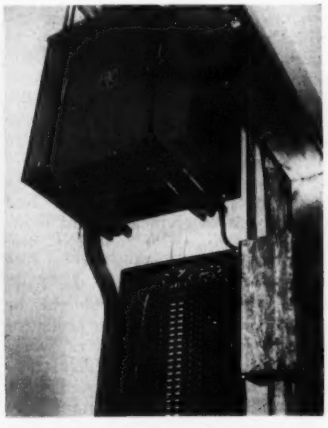
Spot network substation (left) and main 4,000-amp switchboard (right) for serving new California State Capitol Annex

Capitol Annex Uses 480-v Distribution

Clinton S. King
Sacramento Municipal Utility District

When the new State Capitol Annex in Sacramento, Calif., opens this summer it will boast of the latest type of electric distribution system being used in commercial buildings. This will be a 480-v, 3-phase system with dry-type transformers stepping down from 480 v delta to 120/208 v, 3-phase wye, for each block of load. There are 39 of these transformers furnished by the Marcus Transformer Co., six to each of five main floors, ranging in size from 25 to 75 kva. Three 200-kva single-phase transformers of the same voltage will serve the old Capitol building. Total connected load on the two buildings will be approximately 3,100 kw. Such a system of distribution has shown savings of from 17 to 19% in two other commercial wiring installations in California where it has been used.



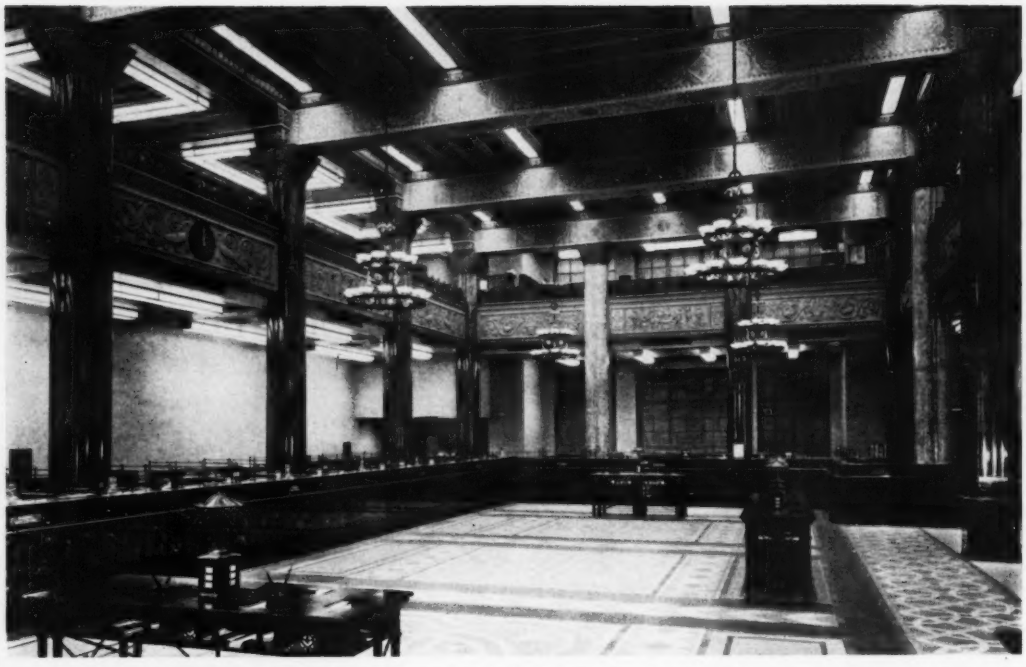


Main 4,000-amp circuit breaker (left) and dry type 480-v load center (right)

The system allows the main power load, approximately 940 hp connected, to be fed directly at 480 v. Included in this are two 200-hp compressors, seven 35-hp m-g sets on elevators, and two 50-hp circulating pumps.

The Sacramento Municipal Utility District will serve this load with a secondary spot network fed from three 12-kv feeders, each supplying power to a 1,000-kva, 3-phase, 12,000 to 277/480-v, delta-wye, Westinghouse network transformer. This will provide a firm capacity of 2,600 kva with one feeder out of service and 130% load on the two remaining transformers.

A 4,000-amp ventilated hollow square bus made by Square D connects these transformers to the main switch. This circuit breaker has a rating of 4,000 amp, 100,000 amp interrupting capacity, and was furnished by the ITE Circuit Breaker Co. Main switchboard was supplied by the Square D Co., using ITE circuit breakers. The electrical contractor was the Victory Engineering Co. of Los Angeles.



Custom-made fluorescent lighting fixtures transform this highly ornamented bank interior into a pleasing symphony

Relighting the Denver National Bank

Is fine example of harmoniously applying engineered modern lighting to a highly ornamented Byzantine architecture

One of the most imposing structures built on Denver's 17th Street's financial district in 1928 was the Denver National Bank building, by the architectural firm of William E. and Arthur A. Fisher. It stands today as one of the nation's outstanding examples of modified Byzantine architecture. The interior, which occupies the entire first floor and portions of the basement and second floors, is the finest example of highly ornamented interior treatment. Blended together are rich warm colorings of deep ivory and brown walls and terrazzo, accented in black and green Italian marbles, with the History of Money reproduced in bold relief cast plaster ornaments and plaques.

At the time this structure was built, lighting of interiors had not assumed the proportions of "Engineering for Illumination" as occurs today. Consequently, outlets were spaced for convenience to architectural pattern. Emphasis was placed entirely upon ornamentation and period design, with little or no thought given to illumination as we know it today. Standards of lighting levels were comparatively low. Such high intensity mediums as fluorescent lighting were unknown. The problems of reflectance factors and brightness contrasts were yet to be considered. However, within the standards of that era, the best possible system of incandescent lighting from decorative wrought iron chandeliers was installed.

It became apparent to the bank officials that something should be done about the lighting, in order for the caliber of their employees' working conditions to equal the high standard of their other services. Present day standards in new structures were calling attention to poor lighting conditions. In the original installation, maximum averages of illumination for bank employees working on intricate seeing tasks was 10 f-c, and in some areas as low as 3 f-c. It was an absolute necessity for every machine and desk to use an auxiliary portable desk lamp in order to achieve minimum seeing conditions. Because of the very dark interior finishes and improper shielding of point-source luminaires, low reflectance factors and brightness contrasts made the existing system extremely uncomfortable.

To the lighting engineer, this relighting problem presented a challenge, one which not only required the proper engineering knowledge, but a companion relationship to the architectural features of the interior. In order to provide a minimum of 50 f-c in the working areas, and 25 f-c in the circulation areas, lumens required dictated the wattage load. It was necessary to provide considerable increase in wattage availability. Architectural limitations of existing columns, bays and ceiling patterns were not conducive to simple layout and location of fixtures.

Engineered lighting overcame architectural and ornamental conditions which had long deterred attempt at relighting

In order to harmonize with the decorative interior design, it was necessary to use custom-built fixtures, at the same time conforming to the limitations of the modern light source, the slimline lamp. High lighting levels had to be controlled for brightness contrasts, because of the low reflectance backgrounds presented by the dark interior. This was accomplished with the use of Holophane Controlenses of low-brightness design and low translucence opal glass side panels of Albalite glass. Where fixture position was such that its critical viewing angles from employees and the public were unavoidable, the denser Monolite glass side panels were used. In all cases these were used in fixtures with incandescent sources. This method of light control and shielding of high level lighting units insured against discomfort and provided low levels of illumination on the highly decorated ceiling surfaces. The resulting effect was most pleasing.

The architectural and ornamental conditions placed limitations on fixture locations. Columns and beams (see photos) divided the ceiling areas into rectangular and "L" shaped bays. Each of these is covered with dark finished acoustical tile within ornamental plaster borders, and in some instances containing a skylight. The existing air conditioning grills are permanently located and prevent the ideal in fixture spacing. The ceiling of the public entrance lobby is patterned in squares of ornamental plaster, some of which contain bold relief designs of early historical coins. In order to comply with these limitations a square fixture is used, mounted on alternate plaques as illustrated.

The high ceiling area over the banking lobby is constructed entirely of cast concrete beams, except for three large central skylights. The recesses between the beams are utilized for installation of recessed fixtures, using 430 m-a slimline lamps. Since the open-type teller's cage and deal plates extend from under the mezzanine floor out into the high ceiling area, incandescent units employing 300-w lamps over Holophane Controlenses of focusing distribution are incorporated with the slimline fixtures around the perimeter of the area over the tellers' cages.

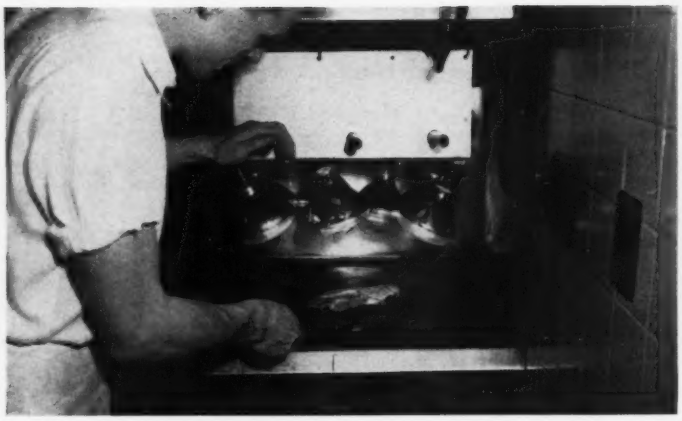
The ornamental wrought iron chandeliers have been retained in the central banking lobby, for decorative effect only. Lamp wattage has been reduced to 25 w to eliminate discomfort when viewed from the mezzanine.

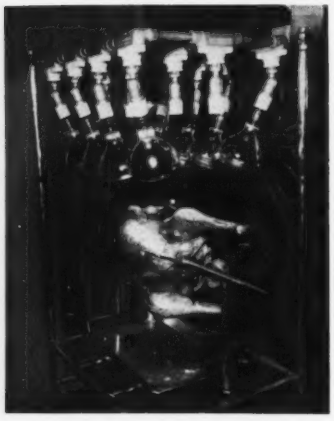
All space on the mezzanine is utilized as bookkeeping area, and is lighted to an average level of 50 to 60 f-c. The bays and skylights permitted an installation of rectangular and "L" patterns of 72 in. and 96 in. slimline units, with incandescent Holophane corner boxes to complete the patterns. Because of the architectural limitations over the first floor office space and teller area, this was not possible. Continuous rows of slimline fixtures provided the only practical method in these areas.

The standard warm white slimline and fluorescent lamps are installed throughout. A study of the reaction of light color to the highly decorated interior of warm pigmentation determined this lamp to be the most satisfactory. Also, the contrast of viewed light color relative to the numerous incandescent units is less noticeable.

Considerable attention was directed to the problem of maintenance. In so large an installation with high ceilings and with the character of work, conditions were such as to prevent spot maintenance at any given time. Therefore, all fixture bottoms are hinged with simple spring catches for easy access to the lamps.

This most interesting installation was designed, engineered and manufactured by the Albert Sechrist Mfg. Co. of Denver, Colo. Installation was made by the Sturgeon Electric Co., Inc., also of Denver.





Steak is broiled on one side by infrared, on the other by electric griddle. Right: Infrared roasting of big turkey

Rare, Medium or Well—With Infrared

Arthur H. Greisser

Portland General Electric Co.

The versatility and economy of infrared electric energy for cooking, baking and retaining food in an appetizing display for quick service is exemplified in Ireland's two restaurants in the Portland, Ore., shopping and financial district. The owner and manager is Elston Ireland, who gained national recognition for his proficiency in restaurant operation when he was elected president of the National Restaurant Assn. for the 1950-51 period. With his background of continuous and successful experience since 1923 in the use of electric service for *all* cooking and baking operations, it was logical that he should pioneer extensive experiments and gain success with infrared to supplement the conventional commercial electric range and bake oven equipment.

The use of infrared lamps for roasting stemmed from Ireland's observation of a slight cooking process under the food-warming lamps installed above the hot sandwich "bar" of his "Mart" as illustrated. This dry heat food table, sized for four No. 200 pans, originally was fitted with 16 250-w Pyrex R-40 infrared lamps to maintain roasts and other foods at proper temperature for serving. By clamping six additional lamps with swivel mountings to the frame of the food warmer in the area above a huge beef roast, a concentration of heat is obtained which permits roasting to proceed as the meat is sliced. The savory appearance of juicy beef cooking under a blast of light induces a guest to order his favorite cut—rare, medium or well done—even though he intended only to have a lighter snack of pie and coffee. If orders for medium or well-done meat are exceeding those for rare, the chef moves three to five of the supplemental lamps to concentrate more heat where it is needed; thus it is possible to maintain a fairly flat surface for slicing, conserve the juices and satisfy the variable preferences of the guests.

Show Window Roasting

To capitalize on the appetizing appeal of meats roasting in what appears to be a blaze of light, the initial cooking of beef roasts and complete roasting of hams and turkeys now is accomplished in one of the front big show windows of Ireland's Mart. A special stand of tubular metal, designed by Don Smith of Ireland's staff, was constructed to hold either a shallow roasting pan or a motor-driven and removable spit. Mounted on the top of the stand in a vertically adjustable frame are a total of 12 swivel-base sockets, grouped in three parallel rows with a 250-w R-40 Pyrex infrared lamp in each socket. The lamps are on 7-in. centers in a square configuration. The over-all height of the stand is approximately five feet. This setup makes a very attractive display in the front window and encourages guests to enter the Mart and order a cut done to their tastes. A tantalizing aroma of roasted meat is faintly distinguishable in the area near the roast but no excessive air heating is in evidence. Space is utilized which otherwise was wasted and the compact kitchen in the lower floor is relieved of this roasting duty.

Trimmed prime steer beef round of 65 to 70 lb gross weight is first boned and the cavity filled with seasoned carrots, celery and other raw vegetables. It is then tied and, with the larger end down, set in a shallow pan. At 10:00 p.m. each night, one of these roasts is placed in the window to cook at 6-8 in. distance from eight infrared lamps directed so that their heat rays fall primarily in the zone encircling the upper side of the roast. This roast is unattended during the cooking period which extends to 10:00 a.m. of the following morning. It is then placed under the lamps of the "dry heat" food table at the hot food sandwich serving center.

By having three areas of the roast subjected for twelve hours to high, medium and low concentrations of infrared heat rays, well-done to rare

There is no waste with infrared roasting of beef. Elston Ireland at right

meat slices can be served immediately after removing the top ¼ in. of the roast at the smaller end. The well-done and medium zones are from 1 to 1½ in. in depth.

Three 250-w lamps at the sandwich counter or bar provide sufficient heat to hold the roast ready for servings. Further cooking is accomplished by the previously mentioned use of additional clamp-on lamps directionally adjusted to concentrate heat where needed to maintain well-done and medium areas. The faces of the lamps are about 19 in. above the rims of the No. 200 pan inserts.

One of the many advantages of this roasting process is that juicy and tender beef is available down to the last slice at the bottom of the roast. There are no tough tendons or gristle to be removed as they are thoroughly tenderized. No overcooked and crusted meat has been present for discard or loss in value. Depending on the comparable oven roasting temperature and relative coverage of fat, this elimination of overcooked beef amounts to 3 to 10 lb of the original raw weights; and at present-day prices of beef, this is a substantial saving.

Roast Turkey

Top quality turkeys of 30 lb weight (New York dressed) are spitted and cooked ready to serve in 3½ to 4 hr with eight to ten lamps at a distance of 7 to 8 in. from the surface of the fowl. The slow rotation of one revolution in two minutes allows all portions to be cooked perfectly with no attention until the last half hour when some directional adjustment of the lamps may be necessary to compensate for variations in the browning. An original feature of the spit developed by Don Smith is the stainless steel truss or spreader fork with arms at 120° which holds the legs away from the carcass and permits the infrared rays to reach all surfaces of the turkey.

The number of lamps used varies with the length of the turkey, and the speed desired for the roasting. The use of 12 lamps reduces the cooking time about one half hour.

Whole Hams

Premium hams are baked in the show window and on the spit under 12 lights in 2½ hr. The lights are about 8 in. distant from the ham's surface.

Steaks and hamburgers are cooked in the main kitchen in the lower floor, by infrared heat energy, from seven 375-w R-40 Pyrex lamps mounted on a 10x12-in. conduit frame with flexible sockets. The frame is suspended from hooks in the hood over a conventional electric griddle, as shown, maintained at approximately 450°. This suspension brings the lamp faces at 6½ in. elevation above the griddle. Hamburgers and small, thin tenderized minute steaks are both placed on the griddle and under the lamps. This is a rapid method of cooking which retains the juices.

New York cuts 1½ in. to 2 in. in thickness and in *frozen* condition, are broiled on a rack supported by a framework resting on the electric griddle. The rack is of such height as to bring the top surface of the steak within about one inch from the lamp faces. The lamp energy does the broiling, but the heat from the griddle aids in thawing the under surface. Only 15 minutes is required to cook a New York steak for a medium order.

Baking and Broiling Salmon

In Ireland's restaurants, fresh Columbia River salmon are cooked by infrared for two types of servings—broiled slices or baked whole fish. Sliced sections of this tasty salmon are placed, after seasoning, on the hot electric griddle in the main kitchen. The upper side is simultaneously broiled by the aforementioned infrared unit of seven 375-w Pyrex lamps. Only six minutes are required to broil a sliced portion.

Whole salmon of 10 to 15 lb weight are boned, seasoned on the inside, and placed in a shallow baking pan under the infrared units of the dry heat table in Ireland's Mart. The pan is elevated to bring the top surface of the fish to within 13 in. of the lamp faces. Sufficient lamps are then adjusted to provide a heat concentration of 5 in. diameter per lamp for the entire length of the salmon. Only two hours are required to bake the salmon and produce a delicious brown color on the skin. It is so thoroughly cooked that it is served in sections with a spoon.

Advantages in Infrared Cooking

The advantages of this revolutionary and economical type roasting and baking are manifold and are recognized by both the guests and the restaurant owner. They may be summarized as:

1. Better satisfaction on the part of the guests because the roasts are tender, juicy, and cooked to suit their desires.

2. Greater net profit on hot roast beef, turkey, and ham and plate servings because of about a 20% average reduction in meat shrinkage compared with low temperature oven roasting. Most of this reduction in loss is created by the tenderizing quality of infrared energy (particularly with beef roasts) which has eliminated the necessity of cutting out and throwing away the gristle. A further gain results from the absence of crusting and overcooked areas common to oven roasted meats. This further saving varies from 3 to 10 lb on beef roasts of 65 to 70 lb initial gross weight. This advantage alone holds forth great promise for the future of infrared roasting.

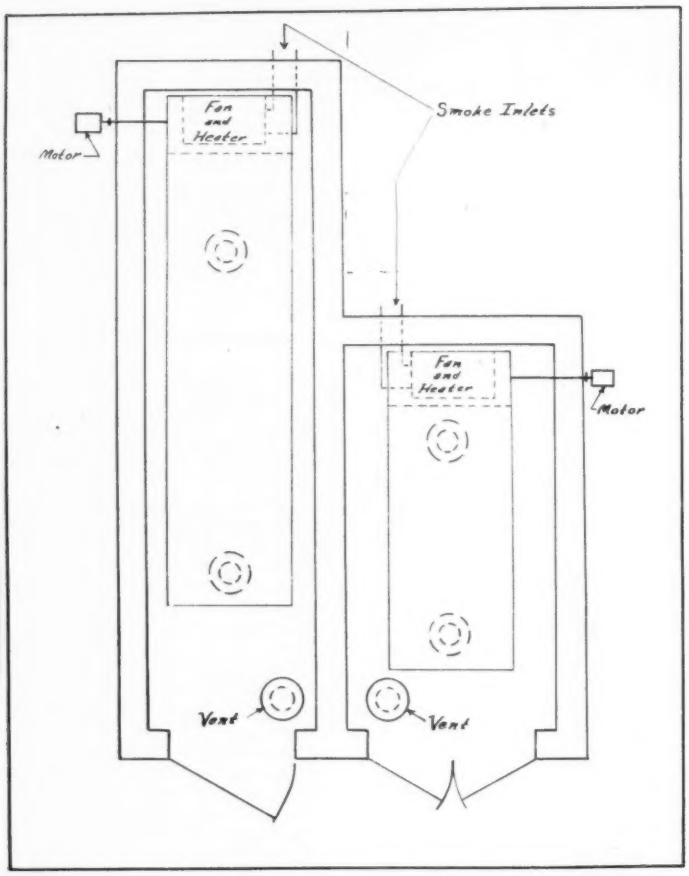
3. Increased sales volume arising from the eye appeal of the roasted meats and the appetizing aroma of the process.

The writer gratefully acknowledges the patient and thorough explanations by Elston Ireland and his capable assistants, Mary Elizabeth Klotz and Donald Smith.

NORTHWEST ELECTRIC LIGHT & POWER ASSOCIATION

Utilization Data Sheet No. 82

SUBJECT: Electric Heated Smoke House for Meat Curing
CUSTOMER: Vans Packing Co., Boise, Idaho
TYPE OF BUSINESS: Meat Packing
SERVICE COMPANY: Idaho Packing Co.
DATA SHEET PREPARED BY: Earl E. Haroldsen



Electrically heated smoke house provides even distribution of heat and smoke

Vans Packing Co. was having trouble with its smoke houses, in that the quality of meat was not uniform and there was too much shrinkage. The company had been supplying both heat and smoke from a 22-in. wood-fired furnace. It sought advice from the Idaho Power Co. to see if there was a solution through the application of electricity.

Idaho Power Co. resolved the problem into basic conditions necessary for meat curing: (1) maintenance of prescribed temperature and (2) uniform distribution of heat and smoke, and recommended the installation of electric heat and fans.

The Brown recorder temperature control utilizes precut cams to give predetermined time and temperature.

Results

Advantages of the electric installation are: Close control of temperature and the ability to vary the temperature throughout the curing period. Maintaining a specified condition makes it possible to turn out uniform products every day with a very definite savings in shrinkage. Actual figures on shrinkage are not available but it is the opinion of the customer that the savings in shrinkage more than pay for the cost of electricity.

The coal tar products present in the smoke do not seem to bother the equipment except around the heater terminals. These must be kept clean to prevent flashover. Considerable study was given in the design to produce uniform air circulation. The arrangement of the Anemostats in the ceiling seems to give very good results as the product is quite uniform even on heavy loading.

The smoke houses have 8-in. brick walls and steel doors. Ceilings are insulated with 8 in. of fiberglas.

Equipment

Smoke house No. 1:

Capacity:	2,000 lb meat
Heater:	Chromalox 15 kw, Catalog No. CAB-151
Thermostat:	Brown Recorder No. 6421-816, 50° to 250°
Contactor:	Westinghouse 11-200-S3
Limit switch:	Chromalox No. C59, 200° to 500° set on 350°

Smoke house No. 2:

Capacity:	1,400 lb meat
Heater:	Chromalox 15 kw, Catalog No. CAB-151
Thermostat:	Mercoid Manual, 180° to 200°
Contactor:	Westinghouse 11-200-S3
Limit switch:	Mercoid No. C59

Operating Data

Two smoke houses: 2,000 lb and 1,400 lb capacity
Connected heat load in each: 15 kw
Maximum demand: 30 kw
Monthly production average: 70,000 lb meat cured
Monthly consumption average: 3,200 kwh
Average energy requirement: 46 whr per lb
Operating cost per load (1,000 lb) of meat, average: 45c
Typical operating cycle for curing ham, which requires longest time and highest temperature:
start 130° 2 hr
then 150° 2 hr
then 180° 1 hr for tenderizing
Energy requirement for one load (1,000 lb) of ham, average: 60 kwh

The accompanying drawing shows details of the installation.

ELECTRICAL WEST Contractors' News Letter

QUICK NEWS ON TRENDS, LAWS, CODES, MATERIALS, EQUIPMENT, COSTS, WAGES, ETC.

Still alive

Building activity and hence contracting and employment are spotty, some places being busy, others slow. Materials seem to be holding up pretty well except that as items run out they are slow being replaced in stock. Takes more of a contractor's time trying to find everything needed or acceptable substitutes. Whether the CMP plan that goes into effect July 1 will improve this is dubious. It adds paper work, that's for sure.

Means higher costs

Wage increases seem to have come to rest, at least temporarily, most contracts being renewed in June. Alameda and Contra Costa counties of California upped the scale to $2.65 plus the 4% vacation, total $2.75, and made it apply to all time worked. not just straight time. Los Angeles went to the Council on Industrial Relations over district and travel differences, the scale raise to $2.75 not being at issue.

One big local

A line agreement of significance was signed by the Alameda and Contra Costa county branches of NECA as the first step of IBEW to merge all line locals in PG and E territory into its utility local 1245. Local 50 is thus eliminated and the others will be also absorbed in order to get one agreement for northern California and northern Nevada with uniform conditions. Three methods are set up for reporting to the job: (1) Shop to shop, (2) direct to the job (with a 16c per air mile one way travel bonus within a 20-mile radius, or a $5 per day per man, in lieu of board and travel expense). This represents the only progress to date toward an area line agreement for California and Nevada.

Price fix

Fit or not, electrical contractors have been advised to file under CPR 34, even though there has been talk of a special construction pricing order. CPR-34 seems to be designed to cover servicing of appliances and doing small service jobs, but is hard to fit to lump sum contracting. Biddle Trade Bureau has advised its subscribers that evidently they may continue to use its retail book prices to the same extent as during the base period, but making sure to give the same discount off book prices they customarily did. This will not help them on labor. The same rate for labor per hour used in the base period must be reported, posted and adhered to, regardless of any wage scale increases since then. Despite pleas, letters, telegrams from associations, individuals and even officials of OPS itself, no answer to the problem of wage increases has come.

No more

General Electric has announced that its lamp department will discontinue the manufacture and sale of fluorescent sign tubing, Aug. 31.

All under CMP

NPA Administrator Manly Fleischmann told the press steps are being taken to lead a 100% CMP by the fourth quarter of this year, possibly closing the "open end" of CMP. He indicated, however, that steel production and some other production had been increased so well as to assure more of steel and some other now tightly restricted materials and permit some stopped projects to be resumed (such as underground garages that can be used as bomb shelters.)

Info helper

A second edition of Lincoln's Industrial Commercial Reference will be off the presses by September, says Electrical Modernization Bureau Inc, 33 Washington St., Yonkers, N. Y. It will cost $25, have 1,500 pages. 750 tables and diagrams, 1,400 illustrations and will annotate the 1951 National Electrical Code.

Scrap drive

Everyone is asked to do everything possible to hasten scrap metals to metal salvage markets as the supply of scrap is getting low. This is particularly true of steel scrap, without which new steel production is retarded.

Mr. Code himself

Alvah R. Small has retired as chairman of the Electrical Coordinating Committee of NFPA, the final committee on the processing of the National Electrical Code. M. M. Brandon, electrical engineer for Underwriters' Laboratories Inc., in New York, and a member of the committee, succeeds Small as chairman. Brandon has also been made vice-president of UL and Karl S. Geiges made chief electrical engineer.

Concentrate

Edwards Co. Inc., of Norwalk, Conn., makers of electric signaling devices, says that its trading areas for Salt Lake City and Boise will now be covered from its San Francisco office and Robert Kempton, district manager in that office, will supervise the area.

Valley bureau

Imperial Valley now has an Adequate Wiring program under way as the Imperial Valley A-W Bureau was set up. Paul Post, commercial power superintendent for Imperial Irrigation District, is secretary of the new group and Wayne Hinson is president. A. K. Bennett, A-W specialist for Los Angeles Department of Water & Power, addressed the first meeting. First home certified was wired by John Emerson, electrical contractor.

Ease off

Material prices, however, are subject to adjustments set up by Supplementary Regulation 29. Wholesalers may pass on increases granted to manufacturers, particularly those which were in the mill just prior to the freeze but had not been made yet on new price sheets.

Dual purpose

Electrical Maintenance Engineers Assn. of So. Calif. is considering making a combined conference and shew of its 1952 annual industrial electrical exposition. This is because there may be fewer new products to show and also to stimulate higher production through a number of informative talks by experts in many phases of industrial electrification.

Promoted

Popular N. J. MacDonald of Thomas & Betts Co. has been promoted by his boss, George C. Thomas Jr., to vice-president in charge of all of the company's operations instead of just sales.

New source

Sylvania Electric's revolutionary new way to produce light, by means of a panel of glowing glass instead of tubes or bulbs, is now ready to be marketed. It was demonstrated recently, after being sprung for the first time at the IES convention at Pasadena last year. Life magazine featured it recently. Applications to entire ceilings or walls, or to table top, clock faces, stair risers, switchplates and signs are among its possibilities . . .

New book

A very much needed booklet, "Color Is How You Light It," is now available from Sylvania for 50c. It also puts to practical use the study reported at last year's IES conference. The book tells what to expect in the way of color change as it appears under the eight so-called "white" lights from fluorescent and incandescent sources. The new book adds the effect

New fixture

of the two deluxe colors on the 40 popular pigment colors . . . A Sylva Ring incandescent fixture for use with 300- or 500-w silvered-bowl lamps in school and office illumination has been added to Sylvania's line of fixtures.

Houses away!

Lakewood Park, the nation's largest housing development near Long Beach, shut down after 7,400 of its proposed 17,000 homes were built because of Regulation X, is about to start again under FHA Section 213. The two- and three-bedroom homes, in 20 models, sell at from $10,000 to $12,000 with a $700 down and $60 monthly payments and all have garbage disposers. The huge shopping center is being completed.

Duct book

Westinghouse has a new 68-page manual describing types of bus ducts and accessories available, with test data, specifications, information on pricing typical installations, bills of materials, etc. It is yours for the asking on your company letterhead to Westinghouse Electric Corp., Box 2099, Pittsburgh 30, and the bulletin is B-4272A.

Special order

The CMP order relating to construction is No. 6, issued June 21. The paragraphs relating to subcontractors are in sections 9 to 13, and 15. They have to work closely with the general contractor and furnish him with schedules of the amounts of controlled materials they want and when.

Still Making Sales from It

Although not anticipated at the time the second annual Ogden Electrical Show was being planned, its attractiveness helped greatly to break the buying slump which had hit the Rocky Mountain region in April. Held at the White City ballroom in Ogden, April 25-26, under the sponsorship of the Intermountain Electrical Assn., Ogden Chapter, the brightly colored and lighted array of home appliances, radio and television sets of 28 exhibits drew about 8,000 people to the two-day, afternoon and evening, showings.

The afternoon attraction was a cooking school and home freezer demonstration conducted by Evelyn Hansen, director of home service, Utah Power & Light Co., Salt Lake City, assisted by Mrs. Ethel Butler, Ogden Division home economist, and featuring Dr. Ethelyn O. Greaves, dean of home economics, State Agricultural College at Logan. C. W. Lowder, announcer for station KLO, acted as master of ceremonies for the shows. The evening entertainment featured local talent groups, including the Utah Valley Boys, South Ogden quartet, the Weber College Musettes, directed by J. Clair Anderson, and tap and ballroom dances by the Albright Trio.

Publicity for the show was a 24-page special section of the Ogden *Standard-Examiner* on Tuesday, April 24, which publicity and large advertising space featured all of the makes of appliances to be exhibited. The show was run on the basis of products rather than dealers and for each product the names of the dealers handling it were shown on cards. The dealers themselves assisted the distributors in demonstrating and talking about the appliances. Cooperation of the food companies was generous and provided

Scenes and people at the Ogden Electrical Show: Top, Evelyn Hansen, UP&L home service director, explains how timers work to a large audience of women. The show committee, most of them—Del B. Foulger, secretary Ogden Chapter IEA, UP&L; Grant Passey, H. D. Sparrow, Roy, Utah; Collin W. Lowder, master of ceremonies; E. Leland Nichols, Lee's Appliances; Boyd A. Read, chapter president; George Coray, vice-president. The other picture shows typical exhibits around the auditorium

numerous door prizes for those attending the show.

The appliances used on the stage for the cooking and freezing demonstrations were later auctioned as "used" appliances. Food prepared during the demonstrations was also given away in drawings. Likewise, a number of the exhibitors had special offers available to those who signed prospect cards at their booths.

Admission was by tickets given away in dealers' stores for which those in attendance paid an additional 10c admission, part of it for federal tax. These admissions helped to cover the cost of the show but were more to keep out those who were not genuinely interested.

Committees responsible for all the details were headed by Boyd A. Read, president of the Ogden Chapter. The general chairman was the immediate past-president, Dan Van Kampen, assisted by Read; George Coray, vice-president, and Delbert B. Foulger, secretary. Vern C. Brown was chairman of the freezer-cooker schools; Hersch Sparrow, the floor show; Lee Nichols, tickets and admission; Grant Passey, allocation of booths; Hubert Durham, building arrangements, wiring, etc.; Frank Ellis, publicity, and Lowder, master of ceremonies.

Ogden dealers participating in the show included: C. C. Anderson Co., J. W. Brewer Tire Co., P. G. Boam Co., Boyle Furniture Co., Brown Appliance Co., Butler Electric Co., Chase Electric Co., Edvalson Appliance & Heating Co., G. M. B. Electric Co., Garrison's, Herrod & Co., Kiesel Sales & Service Co., Lee's Appliance Co., Lowe's Hardware Co., Ogden Electric Co., Read Bros. Appliance Co., Reliable Furniture Co., Roy's Service, Schoss Furniture & Electric Co., Sears Roebuck & Co., Smith Electric Co., H. D. Sparrow Co., Standard Electric Co., Van Kampen & Sons Co., W. E. White Co., Wickre Heating & Appliance Co. Others participating were Coray Clock & Appliance Service, Farr Electric Co., Radio Station KLO, Marveon Sign Co., Utah Power & Light Co., and Flint Distributing Co. of Salt Lake City.

● **B. C. Electric Service League** recently named Howard N. Walters, general sales manager of B. C. Electric Co., as its president for this year. Brig.-Gen. W. W. Foster, B. C. Power Commission, Victoria, was named vice-president. Richard Hall continues as secretary-manager. League council members are C. E. Woogar, T. H. Crosby, H. J. Gough, L. Sewell, D. C. Stephenson, W. A. Williamson and W. C. Mainwaring.

Wonderland Show Being Readied

Designed around a theme of "Electricity for Defense" and with spectacular exhibits by the Armed Forces —Army, Navy, Air Corps and Marines —the Electrical Wonderland Exposition in San Francisco's civic auditorium, Sept. 7-14, is being planned as even bigger and better than last year's successful event. LeRoy H. Bennett, manager, Northern California Electrical Bureau, has promises from the armed forces for these exhibits, which will be so placed that the commercial exhibits may get the benefit of the traffic these create. The center display will even have one of the Navy's giant guided missiles, the Loon, 27 ft long, 18 ft wingspread.

Exhibitors from the electrical industry are being urged to show in their displays of consumer goods some of the devices they are making for the defense program. The San Francisco Electrical Contractors Assn. and Local 6 of IBEW, who last year sponsored the Edison exhibit, plan a totally different display to emphasize the benefits of electricity in the home.

Improvements for this year are: a larger spectator area before the main stage, an enlarged Wonderland Theater of 600 seats to conduct larger shows, more spaces with water and drain connections where actual demonstrations of kitchen and laundry equipment may be shown, better lighting and more decoration, more scientific exhibits. One of these will be the Allis-Chalmers Co.'s mechanical kidney.

A sizable proportion of the available space has already been signed up by committees headed by Harry Lee, Pacific Gas and Electric., San Francisco division sales manager.

● **Schaffer-Wright Inc.** is a new appliance distributing organization with headquarters in Portland, Ore., which will handle Coolerator refrigerators, Hallicrafter radios and TV and Laundry Queen washers for Oregon and southern Washington. Partners are Ward Schaffer, former vice-president and general manager of Coolerator, and Stanley Wright of Vancouver, B. C. Wright owns a chain of retail stores in British Columbia. In announcing future plans Schaffer emphasized that the policy will be strictly that of a specialty organization with planned promotion and sales programs for dealers.

● **Intermountain Electrical Assn.** has set the date for its annual conference as Sept. 21 at the Newhouse Hotel. W. A. Huckins, Utah Power & Light sales manager, will be chairman of the event. A freezer school, to begin about Aug. 1 in Salt Lake, will be held, with all distributors participating, under Chairman Wayne Devenny, Sears, Roebuck & Co. The annual outing will be Aug. 17 at Lagoon under Carlos Stone, chairman. Last year 3,000 persons attended, according to Ray L. Halverson, managing director. Paul Devine, IEA president, talked to the Cache Valley group on "Selling." Leland Flint, president of Flint Distributing Co., spoke recently before the Provo group on "Good Business Practices."

● **Overcoming the difficulty** which the bulk and size of commercial cooking equipment introduces in the presentation of an effective sales training program, Hotpoint has developed a technique that is unique. It makes use of a visual cast projector and then a complete course to be used with it. For the course there are six scripts and accompanying charts, pictures or visuals. The course covers basic sales points, then electricity vs. gas, equipment requirements, features of ranges, griddles, broilers, fry kettles, counter kitchen devices, bake ovens and one on overcoming bugaboos. Planning inplant feeding facilities has special application to the defense production effort. Other materials used with the course, such as manuals, a pocket comparator and even pencils are made up into a kit. Special prices are made for the projector and the "sales educator" kit.

● **Rolf Stoddard** has returned to California Electric Supply Co., San Francisco, from which he left a year or so ago to join the Crosley organization as promotion manager. Stoddard becomes a district sales manager with a district from Palo Alto south, selling the appliance lines (Crosley) handled by this wholesaler.

● **The Electro Mart** is a new electric appliance store opened by J. Byron Klaue at E. 1720 Sprague St., Spokane. Klaue acquired the next-door site to provide additional sales space, making a total of 1,440 sq ft for display, offices, service and used appliance sections.

● **Smith & Crawford,** distributors of radio parts and lamps, have been appointed a distributor for northern California for Conrac television receivers by Clyde Allen, manufacturer's agent.

ELECTRICAL WEST

Sales Guide

News Letter

FOR THE ELECTRICAL MERCHANT OF THE WEST

July 1951

Situation normal--it's got to be sold again. Ample stocks of most everything, from manufacturer, through distributor and dealer, are on hand. Only shortage is of customers. Looks like they've got to be bird-dogged again, as in prewar days--those "normal" times.

Means work, darn it

As for the future, there's been so much crying of shortages to come that most dealers have become a bit blase about it. Our Washington Bureau tells us that tooling up is about done and actual war production hasn't yet started to gobble up materials, so things may get scarce before year's end. What the Korean truce talk may do to change plans is anybody's guess. Officially the word is all-out production regardless to make sure we're re-equipped in case the Kremlin prods another sucker satellite into starting something. Appliance production isn't likely to go under the CMP until January.

Uneasy future

The price war broke out in a rash that seems to be subsiding a bit. That it was more of an epidemic than good merchandising was evident from the way it afflicted dealers in remote places for whom giving away their margin couldn't bring more traffic nor other sales to balance even the advertising expense. The price cuts on fair traded items brought a flurry of business to some metropolitan stores but were wasted on others. A seasonal pickup came along at about the same time.

Cease fire needed too

Five things to remember, says analytical Ken Hamilton: Defense spending will be stepped up, wages have moved higher, production of consumer goods will not increase, credit restrictions may be adjusted but not relaxed, and retail inventory liquidation will soon be completed. Another good idea is to start thinking of what other lines to add to stock when appliances do get scarce next year.

Foresight

Various slick tricks to beat the credit restrictions are running into trouble. The auction racket on TV in Los Angeles brought out only small turnouts, most of them for the entertainment and with pockets sewed up. The Better Business Bureau in Los Angeles was checking into the misleading advertising angle. Selling a full freezer full of food and a deal for wholesale refills was running into trouble from FRB in Las Vegas. FRB was also out after trick kickbacks by the dealer to help finance the down payment. Meanwhile the legitimate save-the down-payment plans are proving good sales bringers with a majority of those signing paying the down payment ahead of time. Once they've made up their mind, they are in a hurry to get it. Congress seemed inclined to relax on Reg. W a bit at press time.

Credit and discredit

Color begins

With tremendous fanfare and a big name cast Columbia started color-casting in New York. Now through distributor of Columbia's own make of TV receivers, Exclusive Sales Corp., in Los Angeles, comes word that CBS may start colorcasts from its Los Angeles station by September and Air King and Columbia Colorvision with 12½-in. tubes will sell, fair traded, at $499; converters at $199.95. That means the color war will be on the heels of the price war. . John Meck Industries says it will have deliveries in August of a color slave unit, Add-a-Color, for use with present b&w sets, to retail at about $150, instead of trying to pin the colorwheel on existing sets. . Dr. Allen DuMont announced that he had seen and produced eminently satisfactory color TV with the use of the RCA three-color tube and DuMont equipment and invited Coy to come see for himself. It makes a completely compatible system without need for converters. . UHF converter demonstrations were arranged for FCC by the RTMA.

Sports on TV

Of more immediate concern, whether sports will be telecast, there were some prospects that the hands-off policy of FCC would relax, at least on the Rose Bowl game, when it learned the figures on what it would bring if sponsored on a national network over the coax that's due to start its electrons moving in September. Meanwhile Saturday Pacific Coast League ball games at Oakland park are being telecast through sponsorship alternately of local distributors and their factories, on KGO-TV. KTTV in Los Angeles made a deal to telecast one-day-late films of USC and UCLA games, this fall. Hoffman will sponsor live TV of Western State and Metropolitan Conferences over KFI-TV.

More TV briefing

Sears' fall and winter catalog lists reductions in TV sets but increases in tires and other items. A 17-in. table model TV is listed at $189.95; last year a 16-in. was $209.95. . RCA is featuring "Operation Trade," a promotion based on trading-in small tube sets on new larger ones. . FCC says it won't unfreeze any channels for some time, so relax. . FTC started its radio-television industry hearings on trade practices and got an earful of complaints about poorly made sets from dealers; heard the color fight between RCA and CBS as RCA electronic advocates wanted CBS color sets advertised as bringing in degraded black and white. . . TV price war in San Francisco area halted Northern California Electrical Bureau's intended TV promotion program. . ABC and United Paramount finally made a merger deal that cut CBS out of buying ABC. . KPIX and KSFO in San Francisco are constructing new studios at Greenwich and Van Ness; transmitter stays on top of the Mark. . Packard-Bell opened a factory service branch in Salt Lake City under George H. Brown; made Carl Duffy, former No. Calif. service manager, service division manager for the entire company, Bob Clark takes Duff's job; Tom Stevens becomes a Los Angeles distributor for the southwest downtown area; and Frank Guernsey, former L. J. Meyberg Co., takes southwest county area; entertained Radio Technicians Assn. at its plant; announced a $4,400 "appreciation awards" letter contest to its users, seeking sales prospects. . Hoffman, recovering from a disastrous fire which wiped out a factory, reported to its stockholders heavier defense contracts, a small inventory of large tube sets chiefly, dealer inventories holding about two-weeks stock, a million dollar drop in sales in the first quarter; showed a built-in TV set in the Southlander model home at the Home Show available to the trade. . Kaye-Halbert repriced its 20-in. table models in walnut, $249.95, up $10, mahogany the same, $259.95, while blond oak went down $10 to $269.95; started signing all dealers on a fair trade agreement; introduced its 1952 line with 21 models, lowest priced $219.95.

Walter T. Baker Jr., becomes Pacific Coast district manager of Westinghouse Electric's appliance division in San Francisco as J. J. Moffatt goes to Los Angeles to be general sales manager of Westinghouse-Free Sewing Machine Co., whose headquarters have moved there. Baker comes from Chicago where he was Northwestern district manager. — Progressive

A growing supply distributor in a western state is looking for a sales manager to direct salesmen and travel himself over a considerable area. If interested better write us; we'll forward. — Wanted

Tyler Fixture Corp. has acquired the operating business of Wilson Refrigeration of Smyrna, Del., which it will operate as a division, just as it does Harder Refrigeration Corp. Lloyd Sutton has been appointed West Coast manager, with quarters at 468 Western Merchandise Mart, San Francisco. Tyler representatives will office there too. — Distributes in West

Suss, Young & Brown Inc., Los Angeles, has created a marketing division, under Marshall Wells, says C. P. Culbert, vice-president. Other changes are: Ed J. Dymek to manage the Zenith TV-radio department; Don Piper, major appliances; Dick Southworth, Lewyt department; Bill Harrison, general appliances; and Peter Frank, sales promotion. — New backfield

Jack Booth, district manager, Proctor, in Los Angeles, announces the appointment of Norman J. Wendell as district representative in the Los Angeles district. — Appointed

Names that make news - beginning with Herb Names, dynamic Denver dealer, who closed the last of his four stores and will concentrate on the rental washing machine business for apartment houses, army bases, etc. . Another Denver man, Wm. Elford, was honored as Bendix man of the year by T. M. Hamilton, division manager, Bendix, Seattle. . A. S. Mehagian, president of Appliance Merchandisers Assn. of Phoenix, and D. E. Urner of Bakersfield, vice-president of NARDA, were recipients of the Brand Names Foundation awards. . Phil Gough, head of Gough Industries, was elected president of Los Angeles Jonathan Club. . . John Gunderson retired as vice-president and western division sales manager of Thor Corp. . J. H. Kidd, zone manager for Hotpoint in Denver, became zone manager in Dallas. . Jess Fetterman, Fetterman & Lockwood, was elected president of Seattle Pot & Kettle Club; Wm. F. Hendrickson of Kenneth J. Dahm Co., of the Salt Lake City Club. . T. Kevin Mallen has been named chairman of the board of Ampex Electric Corp. of San Carlos, makers of tape recorders. . Louis Corwin, radio and appliance distributor, Los Angeles, has been appointed to the wholesale consumers durable goods industry advisory committee for OPS. . Nesco took Mel E. Mauer from Lockheed Aircraft Co., at Burbank, to be its director of manufacturing operations, Chicago. — Men make news

Next month we'll carry a report on the fall and winter market at Western Merchandise Mart, July 16-20, and of the radio-TV and appliance trade dinner, July 18, at which Vale E. Freeman, Westinghouse Electric Corp., Mansfield, manager of department and furniture store sales, will talk on "High Pressure for Progress" and H. Leslie Hoffman, president, Hoffman Radio Corp., Los Angeles, on "The Picture Ahead in Television." J. J. Moffatt, newly appointed gsm of Free Sewing Machine, will be chairman, says George L'Amoreaux. — Market Week

Other show dates: Portland Gift & Art Show, Aug. 12-14, before they start tearing down the venerable old Portland Hotel; Seattle show, — Calendar

Aug. 19-22; San Francisco, Aug. 5-9. Los Angeles holds a Western Housewares Show at the Biltmore, Aug. 19-22, also.

Green River, Wyo., made history as the town which passed an ordinance prohibiting door-to-door selling and last month the U. S. Supreme Court upheld a similar ordinance in Alexandria, La., against magazine salesmen. San Marino and Glendale, Calif., have similar ones but they're not enforced. . Water-short Tucson passed an ordinance against wasting the water used by evaporative coolers. — No canvass upheld

Sunroc Co., makers of electric water coolers and purifiers, moved its West Coast officers from 2331 Westwood Blvd. to 12810 Venice Blvd., Los Angeles, says Paul H. Walter, sales manager. — Moves

Gold E Distributors Inc., of San Diego, opened an Imperial Valley branch at 497 State St., El Centro, carrying the same lines. — Extends

Portable Specialties Division of Mitchell Mfg. Co., Chicago, has shown 22 gift and specialty portable lamps at the Chicago market. They include flexible arm so-called desk types, pin ups, a Tele-clock lamp, children's room lamps with Hummel figurines, Plant-a-lamp for flower or plants and a TV Soft-Lite and others. — Lamp novelties

Two large West Coast lamp manufacturers, Kirkwood Industries Inc., and Savage-California have merged to form Kirkwood-Savage Inc., with offices and showrooms at 1100 S. Santa Fe, Los Angeles. — Join

A measuring tape for light conditioning is offered by G-E Lamp Department to go with its recipe program for home lighting. With it the correct height, shade size and proportions, lamp bulb and reflector bowl, and the distance to the seeing task can all be measured. Available without cost from Inquiry Bureau, General Electric Co., Nela Park, Cleveland 12, Ohio. — Recipe tape

International Harvester is building a new service parts depot and general sales district office for the Rocky Mountain area at 3280 Brighton Blvd., Denver. This will include its refrigerator and freezer parts service. Expect to move in early in 1952. — Parts depot

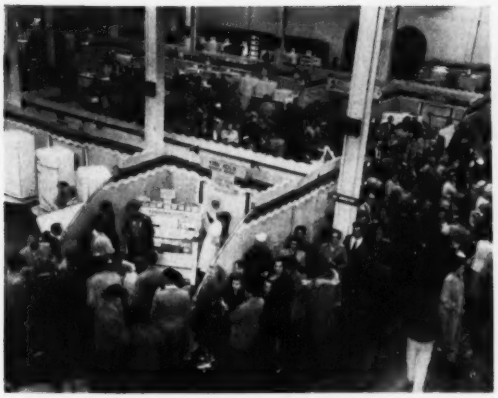
Richmond, Calif., plans to have a home show in its new and super civic auditorium, Oct. 3-7. A new Contra Costa County Appliance Association, too, has been formed to promote sales in the area. — Big plans

General Air Conditioning Corp. of Los Angeles, makers of the small 4.1 cu-ft refrigerator with a range top, now has a complete kitchen in one such unit, with reefer and storage drawer below, three unit range and sink in the top. Its for where dollars or space are short. — Big squeeze

Utah Power & Light Co. sales department under W. A. Huckins, sales manager, staged an intensive, 4-day commercial and industrial sales training conference for all its division sales personnel, June 12-15. More details of this comprehensive program will appear next issue. — Briefed

A new lightweight Air-Flight circulator fan with increased cooling capacity and versatile directional air flow is announced by W. W. Welch Co., Cincinnati. It is designed for home or office use and can be mounted on the desk, window ledge or wall. — Light & cool

General Electric Co. features finger tip control of cooling air in its new window type air conditioner, achieved with a five piece G-E plastics assembly that can be moved by finger touch. — Suit yourself



Every make of home freezer sold in the territory was exhibited.

A home economists headquarters answered packaging problems

S. D. Show Unfreezes Freezer Prospects

Perhaps it was the daily give away of two quarters of prime Kansas beef that did it. At any rate, not even three days of torrential rains out of five days of the show discouraged 75,000 persons from attending the Spring Fair of Frozen Foods & Refrigeration put on in Balboa Park by the San Diego Bureau of Home Appliances, April 25-29.

The quarters of beef even out drew the give away at last year's show of a freezer per day. A meat case display of the two full quarters attracted constant and enormous attention. This feature was made possible by the freezer and refrigerator exhibitors and also included free cutting, packaging, freezing and six months free locker rent, if desired, contributed by the locker plants.

No outside entertainment except the meat and food give aways and the frozen food cooking schools was used to build up attendance, said J. Clark Chamberlain, manager of the bureau.

Each of the 23 makes of refrigerators or freezers merchandised in the area was represented. The list included: Admiral, Amana, Carrier, Coldspot, Coolerator, Crosley, Deepfreeze, Frigidaire, General Electric, Gibson, Hibbard, Hotpoint, International Harvester, Kelvinator, L & H, Norge, Orley, Philco, Servel, Superior, Victor, Wards and Westinghouse.

There were 22 makes of frozen food brands prominently displayed and more than half of the distributors actively sampled their products, to the great enjoyment and evident interest of the visitors. Two paper companies and a plastic corporation had displays of containers and wrapping and packaging materials. The San Diego County Locker Assn. had an elaborate display and demonstration of the complete services offered by the locker plants. This exhibit was housed in a completely glass-enclosed room wherein meat cutting and processing was continuously demonstrated.

The idea pioneered last year, that of bringing outstanding home economists to conduct food cooking schools, was continued. Eighteen demonstrations were conducted in an adjoining auditorium by nine economists: Ruth Stuffer of Amana, Nancy Jaeger of Coolerator, Wilma Sledge of Crosley, Leila Knight of Deepfreeze, Lois Cline of Frigidaire, Marjorie Harper of General Electric, Esther Cleaves of International Harvester, Mary Kelly of Philco and Lois Ferris of Westinghouse. Nearly 10,000 people sat through these expertly conducted demonstrations. Some of them featured semihumorous demonstrations which added to the attraction.

"Without exception, our frozen food and companion exhibitors were immensely pleased with everything about the Spring Fair this year," said Chamberlain. "Our own exhibitors likewise were most enthusiastic over the unexpected degree of interest shown by the public."

Since the show prospects have been followed up by the dealers to close sales that would never have come to their stores without this preselling.

Fall Dates Set

Bureau of Home Appliances of San Diego County has set the date for its fall conference in San Diego as Sept. 11, under chairmanship of Harry E. Callaway. Pattern for the conference will follow the most successful one held last winter beginning with a luncheon session for management personnel, with a banquet meeting for the entire industry. Likewise, plans for the Electrical and Home Appliance Show are being made. It will be held in Balboa Park Nov. 23 through 28. The committee is under chairmanship of Ed Reed. The prospectus on the show will be issued in July and all former exhibitors are to receive the prospectus with reservation cards.

The clever and informative booklet, "Television at Home," produced by the home lighting department of the San Diego Gas & Electric Co., has been issued to television members for distribution to their customers throughout the county. The booklet covers the "do's and don'ts" of television, pointing to the most comfortable methods for television viewing. The new television retailers advisory committee, under Gordon Dawson, is backing the Better Business Bureau's "Television Advertising and Selling Standards" designed to minimize television advertising abuses. An installation and television service clinic is planned for later in the summer and a general meeting of dealer and management principals is expected in July. County meetings are also planned.

ELECTRICAL WEST

Why the Suspicion

PROPOSALS to license all businesses in order to give OPS a whip over their heads to make them conform to its price regulations or lose their license to do business, met a strong rebuff by Congress and certainly strong opposition from businessmen. This upwelling of suspicion over the motives of the administration and refusal to give it that much power over business came spontaneously.

The OPS publicity staff had even tried to pave the way with an advance release to the press explaining its reasons for seeking licensing authority. Over and over in it are assurances that every business would have the absolute right to be licensed and that only after a court hearing would a license be suspended and that only persistent and wilful violators would be brought to court. Then the release goes on to tell all the reasons why licensing is needed to put teeth into enforcement.

Even Herbert Hoover is dragged into the thing to give it authority, because once in 1917 when he was food administrator he was given and he upheld the need for licensing. A long list of other statutes containing licensing is appended also.

But when the President who wants such powers for his control men puts the nation into a war without the consent of Congress, and when he and his predecessor have made treaties and agreements with other nations without consulting Congress that bind us to shameful deals in international affairs, when cabinet members and government departments try sly maneuvers to get the government into business or to build public works that Congress has turned down (see p. 55), where the laws that Congress does pass are ignored and not enforced by the President and executive departments, but when these same bureaus write their own laws without Congress' approval, set up their own judges, prosecute and fine, all contrary to the guarantees in the Constitution, is it any wonder this request for licensing of business is looked upon with suspicion and even fear?

Whatever the merits of licensing in a time of emergency, lack of confidence in the promises of the administration makes people unwilling to trust more of their liberties to them. It is a sorry state of affairs when the people cannot trust their own government. More integrity will have to be shown than apparent at present before more controls will be accepted with any enthusiasm.

Price War is Stupid

WHEN a traditional cutprice store like Macy's of New York breaks out in a rash of price cuts on items it was hitherto restrained from cutting by the Fair Trade laws, and rival Gimbel's "won't be undersold," is that any reason why other retailers all over the country must get into the silly act? When even a crossroads store in a remote Western vacation area, with no "Gimbel's" anywhere near it, splashes big signs over its windows screaming that it too is cutting prices on appliances, it is little short of stupid.

And that is being done by many dealers whose heads ought to be examined. They aren't in the volume class of a Macy's where the loss can be made up in plenty of profit from other less-known products. That was why there was a Fair Trade law in the first place, to keep such unfair advertising tactics from running all small business into bankruptcy and thus creating big store monopolies.

Congratulations George Gadsby

EVERY member of the electrical industry in the Far West will join in congratulating both George M. Gadsby and the EEI on the election of this Western power company executive to head the national utility organization. It is especially appropriate that a Westerner who is thoroughly cognizant of the need for a national coordinated program for combating federal government encroachment in the power field should head the EEI at this time. George Gadsby has long been on the firing line in this fight, as has many another Western power company leader. He will be able to convey to his as-

EDITORIAL VIEWS

sociates from other sections of the country the intensity and importance of the struggle against the constant attacks by the federal power bureaucrats.

For too long a time there has been an underlying attitude in the utility industry that the problems of one region were of little interest or of little importance to another. It is only since the end of the war that any truly national concern has been shown in the fight that Western utilities have been forced to wage for survival. George Gadsby is one of the leaders who has done much to awaken universal interest in this struggle. In his new position he can do even more to rally the industry. He will have a host of well-wishers here in the Far West.

The Preference Clause

JUST so long as the preference clause in the Flood Control Act continues to be interpreted by the Department of Interior as a mandatory order to promote public ownership of electric facilities, just so long will the power companies of the West object. Of all of the federal dodges for pressing forward the public power program, the preference clause is the most unreasonable and objectionable. This fact was forcefully brought out at the EEI convention in Denver by A. J. G. Priest of the American Bar Assn. A former utility lawyer, Mr. Priest nailed down the preference clause as a "perversion that leads to perdition." Here is how he summarized the subject:

"I challenge the Department of the Interior to find in the preference clause any meaning except this: If, when the department is ready to dispose of power from a particular multipurpose project, there are two potential purchasers, one a public body and the other an investor-owned utility, making equally satisfactory offers, the offer of the public body will be accepted. Congress very definitely has not instructed the Department of the Interior to decline to furnish power to an investor-owned utility which is able and willing to purchase such power at the government's bus bar and then proceed to spend the taxpayers' money to construct transmission facilities for the purpose of carrying that power substantial distances to preference customers.

"The preference clauses clearly are the keystone of the public power arch. Indeed, the whole program of the Department of the Interior, and its allies among the public utility district brethren, the promoters of grandiose public power schemes for private profit, sundry other federal agencies, and the various peddlers of tax-free bonds for the particular benefit of persons in the high-income brackets, depends upon the preference provisions which discriminate so outrageously against four-fifths of the people."

Like many others we cannot make ourselves believe that this was the intent of Congress when the provisions were incorporated in the law. It is time now for Congress to define its original intent.

IF we turn back the pages of history, we find that the threat to our free way of life is the root of our trouble. Twice in one generation we have fought two world wars in defense of freedom. A considerable proportion of our public debt of approximately 256 billion dollars was created by wars fought to preserve freedom. And a major portion of our 70-odd billion dollar budget this year goes for the cost of wars—past, present and impending—all in behalf of freedom. Yet, over the years, many of us have taken freedom for granted. By now we should be actually conscious of the fact that freedom, like everything else in life, comes at a price. But no matter what that price may be, we must pay it, for nothing could be worse than to lose our God-given rights and our human dignity. . . . But it's going to take more than money and machines and know-how to win. It is going to take the will and the courage to work, to SAVE, to VOTE and to PRAY.—W. G. Vollmer, president, The Texas & Pacific Railway Co.

Holton James

Hughes Elfstrom

Bradshaw Jack

NWEL&P Group Talks Men and Fringes

Labor-management relations, some aspects of collective bargaining, analysis of fringe benefits and various matters pertaining to accident prevention and safety filled the three-day program of the annual conference of the Personnel and Safety Section, Northwest Electric Light & Power Assn. at Spokane, May 16-18. One day's program was held at the Long Lake plant of the Washington Water Power Co. 30 miles from Spokane on the Spokane River. A special feature of the meeting was a banquet on the night of May 16, at which J. Scott Milne, international secretary, IBEW, was principal speaker. It was attended by labor leaders of the IBEW from San Francisco, Portland, Seattle and Spokane, and by local Spokane people from other industries interested in industrial relations. Leonard Stirn, Washington Water Power Co., chairman of the section, presided at the sessions.

Speaking at the banquet on the subject of "Better Labor-Management Cooperation," Milne likened collective bargaining to a triangle, with labor and management each occupying a corner of the base with the public stationed at the apex. If either labor or management gets out of line, said Milne, the triangle's balance is affected and the public suffers. He commended the success attained in collective bargaining by the utility companies of the Pacific Northwest and made a plea for continued understanding of each other's problems by the representatives of labor and of management.

Collective bargaining came in for another consideration through a speech by Richard McKay, assistant general manager, Washington Water Power Co., at a luncheon session Friday, May 18. He laid down five general rules for successful collective bargaining as follows: (1) a friendly and non-high-hat attitude on the part of management; (2) equality of employee and company representatives; (3) responsibility of individual negotiators; (4) maintain a reasonable position, not arbitrary but supported by facts; (5) inspire mutual confidence by living up to whatever commitments have been made.

The business sessions of the conference opened with a welcome by W. L. Thrailkill, assistant general manager, Washington Water Power Co. In responding, Thomas W. Delzell, chairman of the board, Portland General Electric Co., and president of the association, stated that one of the prime considerations of the utility industry, not only in the Pacific Northwest but nationally as well, was to find a better way for the federal power developments to function within the American free enterprise system. There seems to be a strange notion now among some departments of the government, he said, that the way to preserve free enterprise is to set up industries through allocating power to them on the one hand, while tending to destroy the private utility industry on the other by withholding a sound and sensible contract for power to help that industry serve its hundreds of thousands of customers. He hoped that the federal government in its bureaucratic desire for more economic power would not repeat the mistakes of the private utility industry of the 1920s when holding companies became too powerful.

A pattern for employee training was laid down by Ralph Kluckner, B. C. Electric Co., pointing out that with the growth of businesses beyond the point where close supervision could be had over each employee, the need, the cost, and the complexity of training had increased. In the discussion that followed under L. B. Jack, B. C. Electric Co., it was pointed out that the real problem was in training supervisors and getting the training from them on down to the grass roots. Consensus was that job training should be made broad enough to include training in other aspects of American economic life. Opinion surveys to indicate what understanding the employees have or lack were shown to be important. Any training program must have the wholehearted support of top management.

An analysis of the fringe benefits provided by the several member companies, prepared by C. Herald Campbell, Pacific Power & Light Co., and presented by Paul Keller of that company, indicated that the total cost of all such fringes ran from 24% to 28% of the annual straight time pay roll of the company. General discussion revealed that the utility industry is among the most generous of industries in the giving of fringe benefits, but there was lack of agreement as to which of these benefits should be considered in this category. Some are required by law and some have be-

come standard practice throughout industry. It is important to know what fringe benefits are granted and what they cost, but a further definition of the term is needed.

Merit rating was found to be excellent in theory but very difficult to administer so that it would be fair to all. This was brought out in the personnel problem clinic conducted by Russell James, Portland General Electric Co. The operation of a merit rating plan depends on the supervisor's judgment, and the tendency is to rate up every employee in the category to the top level of the salary scale that is applicable to that category. It was the general consensus that the uprating should be automatic on a time schedule for the lower steps of the scale, and only the top two or three steps should be left to the judgment of supervisors.

Other problems discussed in this clinic showed that the hiring of displaced persons had not been a serious problem in the area; that the placement of injured or handicapped persons was a problem and that rehabilitation centers operated under State Industrial Accident Commission jurisdiction had been helpful in rehabilitating injured persons; that personnel departments now coming into a competitive era in the matter of available manpower would have to revamp employment procedures and spend more time and money on seeking employees; and possibly the industry should again go into an accelerated lineman training program as was done during World War II.

A study of job classifications in the utility industry in an attempt to see how nearly these classifications could be standardized among member companies, and an analysis of union agreement clauses of the several companies was made by Peter Piper of Washington Water Power Co. The section recommended that this work be completed by a small committee and be kept up-to-date from year to year.

The Accident Prevention and Safety part of the program was prepared by Fons Hughes, Pacific Power & Light Co., chairman. In the report on accident causes during 1950, which found both frequency and severity increasing, Roy Elfstrom, B. C. Electric Co., pointed out the two basic causes of accidents were: (1) unsafe mechanical or physical condition, and (2) improper attitude—absent mindedness, recklessness, haste, etc. Tools and working surfaces, such as floors, pathways and stairs, and electrical apparatus were still the three major agencies causing accidents.

Not enough attention is being paid to driver's training according to J. T. Bradshaw, Puget Sound Power & Light Co. A groundman sometimes is moved to truck driver without ever ascertaining whether the person knows how to drive, he declared. Automotive accidents can be cut down only by accentuated training programs and strict discipline. He cited the "Road Test in Traffic" for selecting and training truck drivers, copyright 1945, by and available from the American Automobile Assn., Washington, D. C., as being an excellent guide to drivers' training.

In a discussion of the safety program from a production man's standpoint, George Brunzell, Washington Water Power Co., made a plea for the approach to the subject from the humanitarian rather than the statistical standpoint. The safety man should know all about construction and operation, and about the changes in methods in recent years in order to talk safety to the men. Also there should be full cooperation of the operating people in the promotion of safety consciousness among workers.

A round-table discussion of safe working practices, tools, and various elements in the safety program was led by Roland Blantz, Portland General Electric Co. Some of the subjects discussed were: discipline by suspension or lay off, which was not found to be particularly effective; TV antenna installation should be made in accordance with a safe standard; sales department people have been used effectively to distribute safety literature such as kite flying cautions; there are many ways of incorporating safety into apprenticeship training; hard hats have been found acceptable to linemen in some companies where the wearing of them has been purely voluntary and where the idea of wearing them has been sold to the men rather than forced on them.

A discussion of first aid fire protection equipment by Capt. Ray McDermid of the Spokane Fire Department, brought out the good and bad points in various types of extinguishers, and the types best suited to different kinds of hazardous locations. Periodic inspection of such equipment was declared to be essential.

—and Accountants of Leadership

Think of accounting from the standpoint of the story it tells to operating people and management rather than the story it tells to accountants. This was the gist of the plea of T. E. Roach, president of Idaho Power Co., addressing the opening session of the Accounting & Business Practice Section, Northwest Electric Light & Power Assn., in Boise June 14 and 15, when he urged accountants to take a more aggressive position in the management and operation of their respective companies.

So much of the time of top management today is diverted from attention to purely operating matters of the company that management relies on and needs greater initiative on the part of its accounting departments, not only for the writing of the financial history of the company but also for the interpretation of trends in the business. The accounting division is the first to become aware of dangerous trends, and should assume more aggressive leadership in pointing these out to top management and the operating executive.

Other fields in which accountants should exercise leadership is in aiding in the financing of company expansion, which depends so much on adequate net earnings and efficient operation. Accountants should also take part in telling the company's free enterprise story. The people will rally to our support if they believe our cause is right, said Roach, while, if we show any weakness, people who are not well informed will think maybe the other side is right. Every person has a circle of friends, acquaintances, and activities in which he can exercise influence and leadership, having a bearing on the opinion of the people at large toward privately operated utilities and free enterprise.

This stimulating talk by Roach came at the opening session of the meeting, presided over by V. T. Montgomery, Idaho Power Co., section chairman. There followed round-table discussions of customer accounting problems and collections, plant accounting, stores accounting and priorities, pay roll accounting and the proposed NARUC system of accounts. Each major subject, in charge of a discussion leader, was broken down into subtopics for specific consideration.

Bash Montgomery Snow

The annual banquet was held Thursday evening, June 14. The group also took a trip to see the new construction at the C. J. Strike site of the Idaho Power Co. on the Snake River, where an earth-fill dam will impound water for 90,000 kw.

In the customer accounting discussion, led by Henry Mann, Utah Power & Light Co., E. W. Bredemeier, Portland General Electric Co., explained the operation of the new IBM electronic calculator that his company is adapting to its billing operation, and by which it will eventually produce 98.8% of all customer's bills. The machine will handle 100 punch cards per minute and it is possible to program up to 60 operations on each card, or in other words, the machine will do 6,000 multiplications, divisions, additions or subtractions per minute.

Among recent changes and innovations in accounting practice and procedure reported by the several member companies were noted many new or added applications of machines to accounting and statistical record keeping.

Bimonthly Billing Not Favored

A discussion of the pros and cons of bimonthly billing brought out the consensus that this method of billing was not generally acceptable in this area where extensive use of residential service produced higher monthly bills. Mann stated that the billing costs in his company were not out of line with the billing costs of companies on a bimonthly basis.

On the subject of collections, led by Ralph W. Lawlor, Pacific Power & Light Co., it was found that write offs of bad debts varied in the different companies from one-twentieth of one per cent to four-tenths of one per cent. Some companies argued for more stringent collection methods and it was brought out that those companies having prompt and precise collection rules with cutoff for nonpayments, and are operating these rules without discrimination, had the best collection records.

Practically all companies are charging interest during construction, it was found, in the discussion of plant accounting, with E. C. Alford, Portland General Electric Co., in the chair. Rates ran from 3¾ to 6%, with 6% predominating. It was argued that rates should approximate the cost of money or a fair rate of return. Application of the rate was to jobs above a certain cost or to last more than thirty days, for the jobs outside of the blanket improvement order covering small extensions. Most companies are found to be charging certain other overheads to construction such as a portion of administrative and general expense, engineering cost, extra pay roll costs including the costs of pensions for those working on construction. One company was using a flat percentage of 4% to cover all overhead, but it was pointed out most regulatory commissions forbid the application of a flat percentage.

In discussing the fast amortization of emergency facilities for tax purposes, E. A. Andersen, Idaho Power Co., called attention to a phase of this subject that should be watched. If the emergency facilities are large enough, the amount of depreciation taken each year in the amortization period could result in no "earnings and profits" for the taxable year from which to pay dividends, so that any dividend paid from prior accumulations would have to be considered by the receiving share holder as dividends in partial liquidation. This might not disturb the well-informed stock holder but might cause misunderstandings with those stockholders less well informed.

J. H. Wiley and Nathan L. Scott, Idaho Power Co., outlined the controlled materials plan to go into effect July 1, priority regulations, inventory controls and related topics, stating their company had found it difficult to get steel under DO-97. Scott said it was difficult to estimate requirements under M-50 for the fourth quarter, since it was hard to tell what the customers are going to demand in the way of service in that quarter. The company is keeping two sets of records—a quantity control, representing the flow of the quantities through stores, and quantity-cost records for accounting purposes. The quantity control is merely a tool for the storekeeper to keep track of the status of his inventory.

The pricing of salvage in times of inflation has presented problems, since in some replacement jobs the value of the salvage is more than the original cost of the job plus the cost of removal. It was shown that this tends to distort the method of arriving at the rate of depreciation reserve.

As a basis of discussion for many phases of pay roll accounting, R. N. Davidge, Puget Sound Power & Light Co., discussion leader explained that in his company, 85% of the office employees were on fixed distribution and only those working on construction turned in time slips. All told, 1,100 employees are on a time reporting basis, meaning that the company handles 9,000 daily or biweekly time slips per month. In order to avoid peaks in the classification and machine accounting departments, time slips are classified and distribution cards punched daily. Company pays biweekly and finds it preferable to semimonthly. The company loads only for vacations, sick leave and holiday, i.e., time paid for but not actually worked.

In the discussion, the question of whether overtime should be charged to the job on which the overtime was worked or to the emergency job that caused that job to be done by overtime, led to controversy. The ruling

Announcing

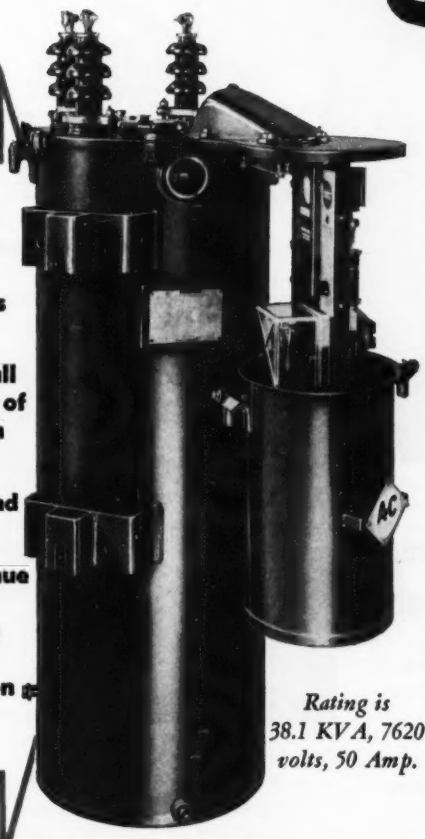
THE NEW 50 AMP ALLIS-CHALMERS 5/8% STEP VOLTAGE REGULATOR

Improves Service —Cuts Complaints

Provides Full 20% Range of Regulation

± 1 Volt Band

Raises Revenue by Increasing KWH Consumption



Rating is 38.1 KVA, 7620 volts, 50 Amp.

NOW YOU CAN take advantage of the features of the JFR regulator in a new rating. The new 50 ampere regulator gives you all the quality features of Allis-Chalmers ⅝% step regulators with a low price tag that makes regulation more economical than ever before. Regardless of load changes or voltage difficulties, with this new regulator you can keep voltage constant at any given point on a line.

The new 50 amp JFR regulator is fully automatic. It regulates line voltage through a range of 20% in 32 small ⅝% steps, and holds ± 1 volt band. Rating is 38.1 kva, 7620 volts, 50 amps for operation at 7960, 7200, 6900, 5000, 4330 and 2500 volts.

Simple Adjustment

Maintenance and adjustment are easy. The unit type control is grouped on a single control panel where it is readily accessible for adjustment or inspection. You need to make only two knob settings. Voltage level and voltage band can be set in less than 60 seconds.

Jump-Proof Mounting Brackets

The jump-proof mounting brackets on this new 50 amp JFR regulator are the same as used on distribution transformers. A heavy driving motor operates under oil for tap changing. There are no commutators, slip rings, brushes, no centrifugal switch.

Today, consult your Allis-Chalmers sales office for complete details on how the new 50 amp JFR regulator can serve you. Or write: Allis-Chalmers, Milwaukee 1, Wisconsin. A-3392

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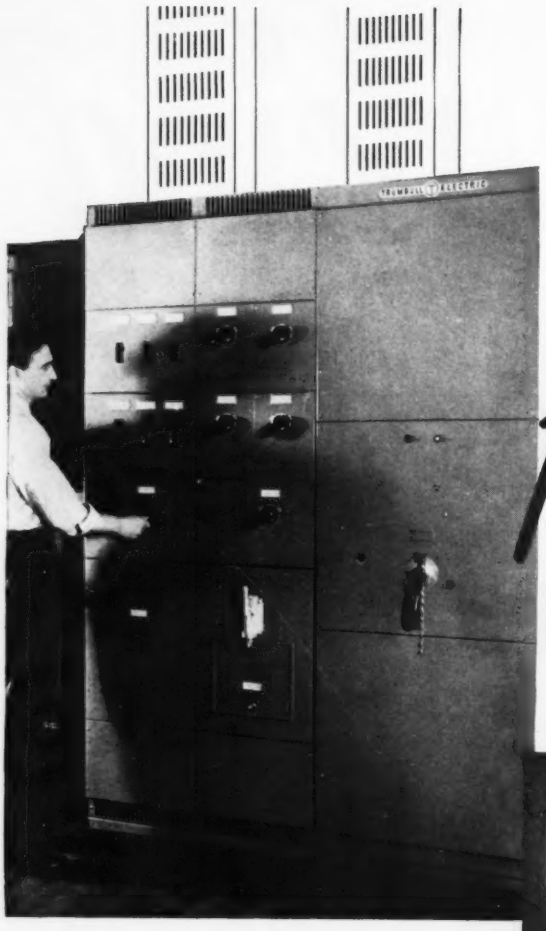
Originators of ⅝% Step Regulation



Announcing

Centr-A-Power

...a cinch to sell on both

New Features Save Floor Space, Speed Up Wiring, Facilitate Operation

LESS FLOOR SPACE NEEDED

Compact trough design allows more troughs to be used in a given area of floor space.

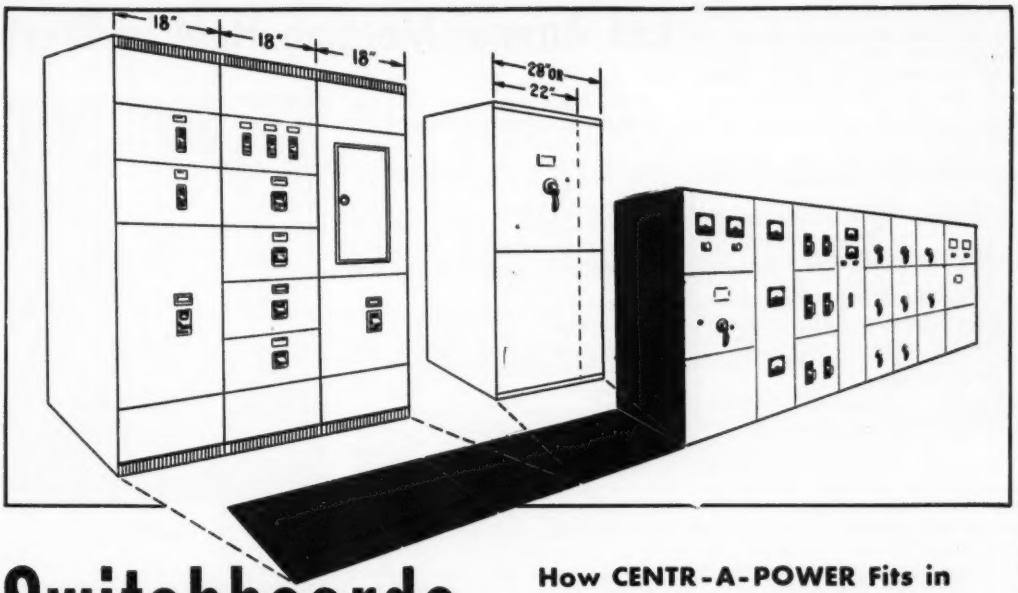
LOTS OF ROOM FOR WIRING

Generous (4 x 8 in.) wiring gutter makes wiring easier —can be accomplished with units in the trough—and allows use of over-size cable on long runs, keeping voltage drop low.

ACCESSIBLE FROM FRONT

CENTR-A-POWER Switchboards are completely accessible from the front, permitting aisle, back-to-back, "L" and "U" installations, further saving floor space.

TRUMBULL'S TRAINLOAD OF NEW PRODUCTS



Switchboards

quality and price!

Save customers installation time and maintenance costs with Trumbull's new type of switchboard for complete low voltage (600 V and under) switching requirements. Because of pre-engineering and standardization, you can now offer highest quality construction at lowest possible cost. Here are some of the features:

Pre-fabricated, rigid steel troughs can be placed in any arrangement to provide a completely dead-front, totally-enclosed switchboard. Wiring gutter design is such that load wiring is isolated from incoming load bus. Compact switch or breaker units, called CENTR-A-PLUGS, are easily mounted or removed. A quick-clip attachment saves time in installation, inspection and maintenance. Self-aligning latches replace bolts and nuts. Positive connection to bus bars is assured by use of spring-loaded, reinforced stabs. Each CENTR-A-POWER unit self-contained and electrically isolated from adjacent units.

How CENTR-A-POWER Fits in with Existing Rigid Type Switchboard Equipment

CENTR-A-POWER is made from three standard troughs, all 90 in. high. At left is unit type CENTR-A-POWER with 18 in. trough; it handles fusible switches through 200 amp. and circuit breakers through 600 amp. Two standard section troughs are indicated in the center. Type A is 22 in. wide, handles 400 and 600 amp. fusible switches. Type B is 28 in. wide, handles fusible switches through 1200 amp. and circuit breakers through 1600 amp.

Unit-Type Troughs (18 in.) are furnished assembled or unassembled. Large standard sections are furnished assembled only.

ALSO—TRUMBULL CENTR-A-POWER CONTROL CENTERS

which are of similar construction and line up mechanically and electrically with CENTR-A-POWER Switchboards.

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Plainville, Conn.

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TRUMBULL'S TRAINLOAD OF NEW PRODUCTS

in Oregon is that the job on which the overtime was worked should be charged with the overtime. Others held that overtime should be distributed over all work performed, and some companies adhere to this practice.

In discussion of the proposed MARUC system of accounts, led by M. M. Ilch, Idaho Power Co., many objections to the proposed classification were voiced, with participation by E. H. Duffy, Montana Power Co.; A. F. Elder, Washington Water Power Co.; K. E. Hutchinson, California Oregon Power Co.; H. B. Rohrbough, Mountain States Power Co.; E. W. Bredemeier and E. C. Alford, Portland General Electric Co.; T. C. Woodside, Utah Power & Light Co.; C. R. Groth, Pacific Power & Light Co.

Some of the principal exceptions taken to the proposed classification were: (1) the requirement for the straight-line method of calculating depreciation by those companies who have maintained depreciation accounting under the compound interest method; (2) the offsetting of asset accounts with reserves; (3) the requirement that records shall be maintained so as to show the quantity of electricity sold and the revenue received from each customer, since some customers are billed under both commercial and residential schedules and are now carried in the accounts under the schedules billed; (4) the segregation of small commercial and industrial sales and large commercial and industrial sales, because of the difficulty of making such segregation under the measurements indicated, and because of the different ideas of regulatory bodies; (5) the lumping of some expense accounts because the proposed condensed accounts are so broad that they do not provide adequate information for control.

The change in nomenclature of "surplus" to "retained income-appropriated and unappropriated" was objected to on the ground that the terminology is not generally accepted usage and is inconsistent with legal terminology.

These were but a few of the many objections found. Also brought out in the discussion were some improvements in the proposed classification as against the classification presently used.

At the closing session, the group nominated T. C. Woodside, Utah Power & Light Co., to be vice-chairman of the section next year, when presumably F. C. Bash, California Oregon Power Co., will be appointed chairman.

EEI Annual Meeting Held in West

For the first time since 1930 the top utility association, now known as Edison Electric Institute, formerly National Electric Light Assn., came to the West for its annual meeting, this time to Denver, June 4-7. Some 1,400 attended the 19th annual convention and named a Westerner, George Gadsby, president of Utah Power & Light Co., as its new president. He succeeds L. V. Sutton, president of Carolina Power & Light Co., who presided over the Denver convention. Among the 1,400 delegates were ample representations from all major Western utility companies.

Reports of the convention and of the papers presented will be featured in *Electrical World* in considerable detail. Only Western speaker of note was former governor of Wyoming, Leslie A. Miller, who spoke on a subject on which he is an authority—water rights. He said that President Truman's water resources policy commission was guided in its thinking by a majority that was public-power-minded and thus slanted against further growth of private enterprise in power production. "Public thinking is being guided into a belief that private enterprise will not or cannot build plants to meet the demands for more power. The hard facts dispute such representations," he contended. He agreed with the need for basin-wide studies and programs but felt more emphasis should be placed on local and state cooperation.

Among the prize winners of the numerous awards made at the convention were some Western companies and individuals. The Coffin Award, for which Central Arizona Light & Power Co. had been nominated, went to Georgia Power for its community development program. British Columbia Electric Railway Co. won a commercial lighting division award in the Planned Lighting group. Of the Laura McCall winners, two were from the West: Mrs. Marjorie Hume, San Diego Gas & Electric Co., was winner of division B; Miss Evelyn Hansen, Utah Power & Light Co., was a division C winner. Among the Hughes award winners Central Arizona Light & Power Co. won second prize for electric dishwasher activity. Pacific Gas & Electric Co. was the first prize winner of the Frank E. Watts award for farm electrification. Utah Power & Light Co. was given one of the three Claude L. Matthews Valor awards on behalf of 120 men whose performance during unusually severe weather conditions last December was "in keeping with the highest traditions of the electric industry."

Gadsby

George M. Gadsby was named president of EEI, the first Westerner to hold that office since EEI was formed in the reorganization of NELA. He has been president of Utah Power & Light Co. since 1929 after some years in other utilities following graduation from MIT. He has been president of the Northwest Electric Light & Power Assn., a director of NAM and EEI, a director of National Assn. of Electric Companies, participant in the advertising program of the utilities and a member of Electric Utility Defense Advisory Council. He has also been active in numerous Utah public affairs.

RMEL

Rocky Mountain Electrical League's 48th annual convention at Santa Fe, New Mexico's La Fonda, Sept. 9-12, expects a record attendance. Public Service Co. of New Mexico will be host and Alex E. Barnes, public relations director, will be general chairman. Additional accommodations have been arranged at La Posada de Santa Fe and Bishops Lodge. Reservations are to be made individually with hotels of one's own choice. President M. C. Heffelman and Vice-President Art Prager have reached across the continent to get top speaking talent. Entertainment and tours are being planned for all and golf will be played Sept. 11 for the Sterne golf trophy.

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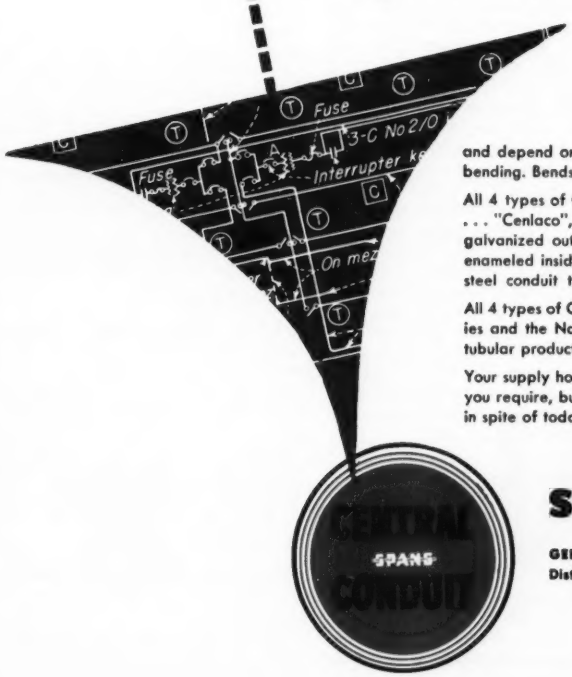

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Central California Chapter, IAEI, chartered a bus to join Northern California and Sacramento Valley inspectors at Modesto, and plugged for the 1952 convention in Fresno. At right, officers of three chapters: H. G. Ufer, SW Section secretary; Prentice Wilson, chairman; M. A. Bader, vice-chairman, No. Calif. Chapter; W. E. Durst, Sacramento chairman; Ken Bliss, No. Calif. secretary; A. W. Nelson, Fresno group chairman; L. B. Sterling, secretary; and Clarence Jarvis, Sacramento Valley secretary

Inspectors

Hawaiian Chapter, IAEI, had an expert from the mainland address it on engineered lighting. R. G. Dummel, district manager, Holophane Co., San Francisco, presented much the same talk and demonstration of control of light rays by means of lenses that he had given to the Rocky Mountain Chapter at Denver. Meetings are held at Hawaiian Electric's Ward St. building. Ed Ralston is program chairman. Code discussion features the regular monthly gatherings.

Puget Sound Chapter will hold its next meeting at Aberdeen, Sept. 8. Last meeting at Tacoma brought forth these items: Bellingham is seeking to pass an ordinance to stop the sale of unsafe electrical equipment; work on changes to the state code should begin now, John Hewitt told the chapter, with early efforts to get all the industry together on what it wants to change; there has been no need for the emergency requirements committee said C. M. Kirsop, since there are no serious shortages as yet; service cable drops to a service were argued without agreement; for ranges with separate tops and ovens such as Thermador and Universal, Seattle and Washington state permit a loop circuit of No. 6 wire; C. S. Alger reported on diversities for groups of water heaters, indicating there was little additional diversity in groups of more than 25. W. L. Gaffney, Tacoma, told of some 125 code changes.

Southern California Chapter saw samples of and heard a description of the new mineral insulated cable, known as safety MI cable, by Dr. D. M. Simmons, vice-president of General Cable Corp., at its May 23 meeting at Long Beach. Designed for use in control circuits, shipboard wiring or where a fireproof and waterproof installation is needed, the cable is a copper tube in which the hot conductor is insulated in a dielectric mineral. An interim amendment to the National Electrical Code has been requested to recognize it as a wiring method. Other items from this and the previous meeting at Culver City: a committee was appointed to consider branch circuit requirements for heating units and appliances; it recommended 80% of rated capacity limitation on conductors, switches, contactors, etc., but will give further study to large heating elements used in industrial devices; a committee was appointed to study requirements for dryer circuits in residences; surplus field telephone wire has been used for low voltage control and trouble with it came from bad connections at terminals rather than the wire itself. Next meeting, July 25, will be at Square D Co. plant.

Electrical Inspectors Assn. of B.C. has set the dates for its third annual conference as Nov. 2-3, at Hotel Georgia, Vancouver. Among topics to be discussed are diversity factors, electric heating, load regulators, transformer vaults, circuit breakers, safety and resuscitation, cold and hot cathode lighting, pole line construction, power factor, electronic controls. This association has held many very informative meetings during the spring and is now taking a vacation until September. It has considered and had committees study and report on grounding, on trailer camp services, on low roof services.

Three chapters of IAEI met at Modesto, May 19, for the second of what has become annual custom. Some 94 members of the Central California Chapter, Sacramento Valley Chapter and Northern California Chapter spent the day in reviewing the changes in the 1951 National Electrical Code. Harold Gerber, consulting engineer and past secretary of the Southwestern Section, explained the changes. Donald V. Doub, PG and E industrial engineer, addressed the luncheon telling of new and spectacular developments in the industry. Max Webb of Lynn and Brooks, representing Union Insulating Co., discussed portions of the code relative to nonmetallic boxes and fittings. Ralph E. Carlson, deputy state fire marshal, explained the jurisdiction of the state over hospital operating room installations and answered a number of questions as to requirements and authority.

IES

National Technical Conference of the Illuminating Engineering Society will be held in Washington, D. C., Aug. 27-30, at Hotel Shoreham. Although some 50 papers in nine technical sessions are scheduled, there are none to be presented by any Westerner at this convention. Sam G. Hibben, Westinghouse Electric Corp., has been elected as the incoming president and will succeed Walter Sturrock, General Electric Co. Lamp Department, who will preside at this convention.

The IES headquarters have been moved to 1860 Broadway, 18th floor, New York 23.

Inland Empire Chapter, Spokane, heard Don Rohrer speak on "Contemporary Home Lighting" at the June 22 meeting. Previous meetings were addressed by M. L. Gordon of DuPont Co. who covered paints and pigments as related to lighting at a joint session with Spokane Chapter AIA; and George Smedberg, Associated Lighting Service, San Francisco, on stage lighting.

Oregon Section had R. E. Madigan, manager airport lighting sales, Line Material Co., talk to it on "Airport Lighting for Defense." He also showed slides of recent installations.

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THE MONTH IN BRIEF

Fish Commission Motion Denied

Denied after a two-week FPC hearing was an Oregon State Fish Commission motion to dismiss Portland General Electric's permit application for a dam on the Deschutes. The motion for dismissal was made on grounds that FPC lacked jurisdiction because no federal lands were involved, the Deschutes was not a navigable stream and power from the dam would not be in interstate commerce. In denying the motion, Examiner Costello pointed out that his decision was not the final authority. The FPC in Washington, he said, would make final rulings. Because many of the issues involved in PGE's Pelton project and Tacoma City Light's proposed Cowlitz River development are basically the same, Costello indicated that FPC may decide both cases at the same time.

Asks Higher Rate Increase

California Electric Power Co. amended upward an application for new rate schedules recently when it asked the public utilities commission for an annual increase of $1,520,850. The original application filed March 7 requested $290,150 less. In its application the company asked that its return be increased to 8.1%, instead of 7.7%, on the basis of higher costs and anticipated taxes.

Owens Gorge Transmission Line Completed

First of four construction phases in the $43 million Owens River Gorge hydro project of the Los Angeles Department of Water & Power was completed last month. This included the 250-mile, 230-kv transmission line from the development to Los Angeles power houses.

Dedicate World's Largest Pumps

Public ceremonies attended by 2,000 on June 14 marked the start of regular pumping operations into Grand Coulee reservoir. The first pump, powered by a 65,000-hp motor, had already poured some 70,000-acre ft into the reservoir during tests. The second pump was to be in operation late in the month. The pumping plant, pumps and motors are the world's largest (EWEST, May, p. 78). A telephone message from Interior Secretary Oscar Chapman signaling the start of the pumps was relayed at the site by Reclamation Commissioner Michael Straus.

Seventeenth Coulee Generator on Line

Also put on the line at Grand Coulee last month was the seventeenth 108,000-kw generator. This machine brought plant capacity to 1,866,000 kw. The eighteenth and final generator is scheduled for completion late in August. Total rated capacity, including three 10,000-kw station service generators, will be 1,974,000 kw.

Rate Increase Approved for Arizona Edison

Arizona Corporation Commission last month approved a $317,000 annual rate increase for Arizona Edison Co. The increase, which averages 8%, had been requested on the basis of greater labor and materials costs and need for new investment capital. The company had not had a general rate boost since it was organized in 1935. Basis was revaluation of company property from $11 million to $19,790,073.

WWP Borrowing Program Approved

Washington Water Power Co. has secured SEC authorization to borrow $26 million from banks up to June 15, 1954. The company asked approval of the borrowing program late in May, stating that its Cabinet Gorge dam and power plant was expected to cost $45,-157,000 through 1953. The Idaho PUC earlier issued an order permitting WWP to extend $26 million in credit for improvements and extensions. Under the program approved by SEC, the company will repay $7,150,000 of bank loans and apply the balance of the money to its construction program.

No New Plan Filed for WWP Sale

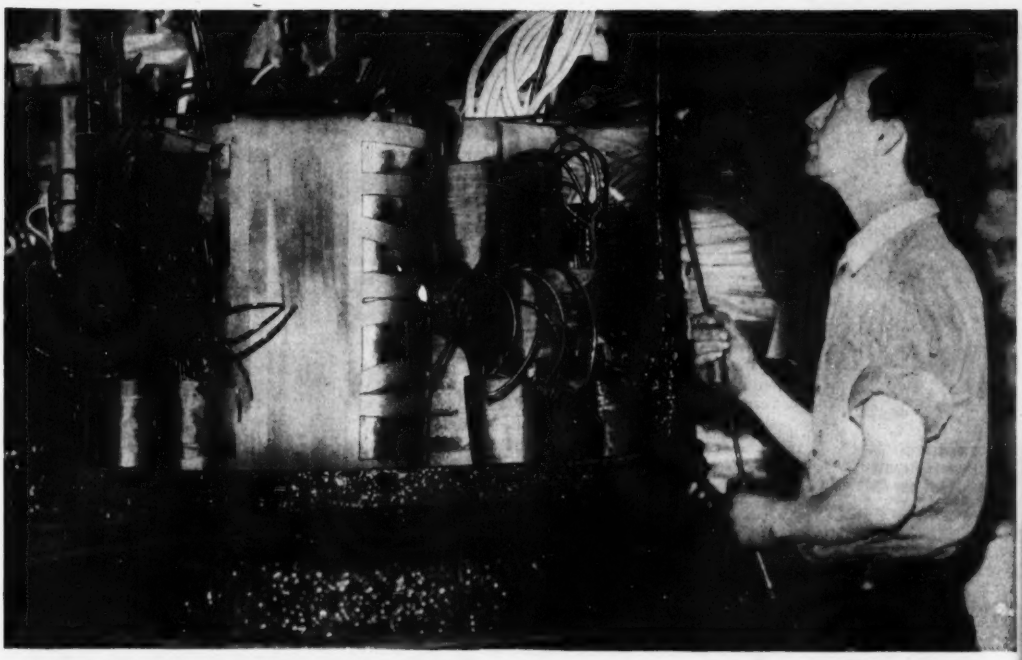
SEC advised Attorney General Robert E. Smylie in mid-June that it had not received a new plan for disposition of American Power & Light's interest in Washington Water Power Co. According to SEC Chairman Harry A. McDonald's letter to Smylie, the commission would have to reappraise its jurisdiction in the matter if a plan different from one considered in February is filed. Smylie said Senator Henry C. Dworshak of Idaho had written that his state would be given adequate notice in case any new proposal for disposition of WWP interests is filed with SEC.

PUDs Will Not Appeal

Eastern Washington PUDs will not appeal a court decision preventing them from buying the Washington Water Power Co., according to C. C. Dill of Spokane, attorney for the Pend Oreille PUD. Dill did not say, however, that the districts would abandon plans to buy part of the system. Injunction against the sale was issued March 28 by Superior Court Judge B. B. Horrigan of Pasco, who ruled that the state law does not authorize Washington PUDs to acquire utilities in other states. About 25% of WWP property is in Idaho.

Edison Requests License

Southern California Edison Co. has asked the Federal Power Commission for a license to build a dam and power plant on the San Joaquin in California. The power house would contain two 63,000-kva vertical generators having a combined capacity of 169,000 hp. It will be known as the Mammoth Pool project. Overall cost is estimated at $39,044,800.



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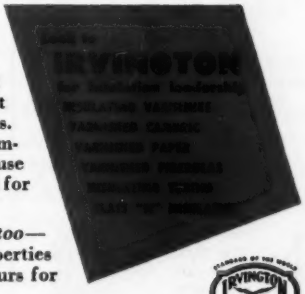

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THIS MONTH'S NEWS

Bill Signed Creating Conservation District

A bill creating the Kings River Conservation District, embracing the Kings River water service area of about 1,200,000 acres in Fresno, Tulare and Kings counties, Calif., has been signed by California's Governor Earl Warren.

Chief sponsor of the legislation was the Kings River Water Users Assn., which at the present time is negotiating with the USBR for a contract governing the charge and use of water made available by the construction of the Pine Flat Dam.

The bill would combine into the one conservation district a total of 31 irrigation districts, mutual water companies, water storage and reclamation districts.

The conservation district would have broad powers to furnish water and electrical energy. It would have the authority to issue general obligation or revenue bonds by a two-thirds vote of the people in the district.

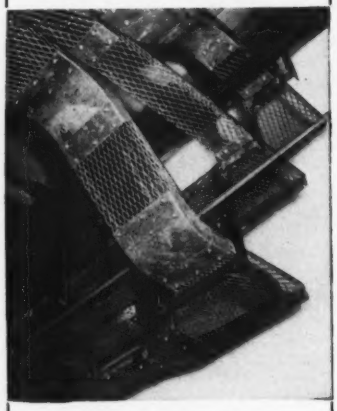
The bill also would give the district the power of eminent domain and would authorize it to cooperate and contract with the federal government, the state and other public agencies.

Its main purpose is to create a single organization to represent the whole Kings River water service area in dealing with the Bureau of Reclamation for Pine Flat Dam water, scheduled to be available in 1954 or 1955.

The bill will become effective Sept. 23. At that time the governor will be authorized to appoint the first board of directors. This board then will call a special election to submit to the voters of the areas involved the question of whether the district shall be ratified. If not, the district will be dissolved. If approved, steps will be taken to elect a board of directors, to serve for staggered four-year terms, consisting of seven members, one each elected from six districts within the major district and one to be elected at large.

● **A $415,000 loan** to the Columbia Basin Cooperative has been approved by the Rural Electrification Administration. The money will be used to construct approximately 100 miles of distribution lines in eastern Oregon.

COPE CABLE TROUGH



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We Mobilize for Freedom

WHY Controls are Necessary

One of the encouraging characteristics of the American people is their dislike for government controls. This augurs well for the future of their economic and political freedom.

But for the next few years we must not only tolerate but also help to make effective a whole battery of emergency government controls over our economic life. If we fail to do this now the future of that freedom we cherish will be imperilled. It is the purpose of this editorial—the third in a special series—to explain in simple terms why this is so.

After our military victory in World War II, we rushed through a demobilization which cut our military strength to about one-tenth of its wartime peak. Our allies did much the same thing. But the Russians maintained much of their wartime military strength and built up that of their satellites. With prodigious speed we switched from military to civilian production and went on to enjoy a rousing postwar boom—the greatest in our history.

This boom was in vigorous progress when, on June 25 last year, the Russian-sponsored North Korean army attacked South Korea. Our industrial production was rolling along at almost twice its prewar level. We had labor shortages in many key industrial areas. Under the impact of heavy buying all along the line, prices were climbing.

When the North Koreans smashed into South Korea they smashed into our national consciousness this fact: if we want a fair chance to save our national freedom from destruction by Communist aggression, we must race to restore some of the military power we had so speedily written off after World War II. And we must do it with our resources already very fully occupied with a boom in civilian business.

Program Small Compared to World War II

Compared with our military effort in World War II, the mobilization on which we are now embarked is small. At its peak, under present schedules, it will absorb no more than one-fifth of the total national production. During World War II we reached a point when nearly half of our total production went for war-making.

Moreover, our economy now is much bigger and stronger than it was in World War II. During the last decade there has been an increase of about 15 percent in our labor force. Our workers have had the training advantage of steady employment. The capacity of our industrial establishment is two-thirds again as great as it was ten years ago. Since the war no less than $70 billion has been spent to expand and modernize it.

Given time, the industrial giant we have created could pick up in its stride the added load of production for defense that now is con-

templated. But speed is of the very essence. There is little dissent from the proposition that if we are to stand off Russian aggression successfully we have, at the outside, two years in which to get ready.

Controls Needed to Prevent Chaos

These two facts – (1) the necessity for speed in our rearmament program and (2) an economy already stretched taut by a record civilian boom—create the general necessity for government controls. If we simply pile the billions of added defense expenditures authorized since last June on top of the civilian boom, and let it go at that, two destructive developments would follow. There would be a scramble for scarce materials, notably metals, which would create chaos in those markets. And prices would go through the roof.

Our situation during this mobilization is radically different from what it was when we rushed to get ready for World War II. Then we started with an economy that was coming out of a long depression. There was plenty of slack. Even in mid-1941 we still had over 6 million unemployed. Thus it was possible for us to expand war production greatly and also increase civilian living standards before the limits of our productive capacity made extensive controls necessary. But as we begin this new mobilization we find our economy already operating virtually at capacity. This fact is of key importance in understanding why this relatively small defense program so quickly requires the imposition of controls.

The selection and administration of controls thus far has been badly bungled. The threat of price controls, for example, was broadcast so vigorously and for so long that our people were virtually asked to raise prices and thereby do much to defeat the controls. Adequate taxation directed so as to attack inflation at the source and thus give direct price control a chance to operate has not yet been provided.

Indeed, we could readily assemble a long and devastating catalog of the deficiencies of the government's control program. But that would not dispose of the necessity for controls – by priority, by allocation, and, as a stop-gap, by direct prescription of selling prices – if we are to carry out our mobilization successfully. That is the only means by which a clear right of way for defense production can be cut through the highways of trade and commerce now jammed with civilian boom business.

Hope In The Wilson Plan

Since he became Director of Mobilization, Charles E. Wilson has added a new element of order and hopefulness to the mobilization program. He has laid out a plan which, if we are spared all-out war, would do three things by 1953. First, it would produce the weapons needed by our army and our allies to meet an immediate threat. Second, it would create the capacity that would enable us to move at high speed into weapons production for all-out war – if necessary. Third, it would create the additional production capacity that would restore by that date our ability to resume the climb of the American civilian standard of living.

In technical and industrial terms the Wilson Plan seems to be feasible. If it is successfully carried out, we should be able to begin getting rid of controls rapidly by 1953. But to carry out the program successfully, it must now have vigorous support from everyone. That does not mean mere agreement that it is a good plan. It means that we must conform to the controls that are necessary to make the plan work. In developing this support, the business community is in position to exercise crucially important leadership.

As has often happened in our national history, we are confronted by a paradox. We must accept emergency controls for the time being to insure survival of the freedom that they infringe. But, as we do this, we may find some comfort in the reflection that while controls from Washington are hateful, controls from Moscow would be infinitely worse.

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How you can use standardized Power Transformers where "specials" seem to be required

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Example: You have a standard 34.5-kv primary, but want a non-standard low voltage of 2300. Select an optional RM rating of 36-to-2.4 kv. Operate at 34.5 kv. You'll get your 2300 volts.

You pay 1% for the optional voltages. You save 8% in base price. You get much faster delivery.

You can get all taps above or below the actual primary voltage:

With RM transformers, you get two taps above and two below the rated primary voltage. By selecting an optional primary rating, you can get all four taps above (or all below) your actual line voltage.

Example: Your high voltage is 34.4 kv. You want all taps below this. By selecting 32.8 kv for the primary rating, you get taps at 34.4, 33.6, 32.0 and 31.2 kv.

You pay 1% for the optional voltage. You save 8% in base price. You get much faster delivery.

You can parallel transformers with different impedances:

Impedances of RM transformers are fixed at 5.5% to 7.0%, depending on high voltage. While this affects division of load when an RM unit is paralleled with an existing transformer, it is *not* as critical as you might think. It seldom results in a serious loss of capacity. Example: You want to parallel a 34.4-kv RM transformer (impedance, 6%) with an existing unit having an impedance of 7%. Theoretical division of load is about 52%—48%. Often actual division will be even better than this because of external impedances. At worst, you have lost less than 4% in capacity. You have saved 8% in cost, gotten much faster delivery.

You can parallel △-Y with Y-△

While in most ratings, RM transformers are available as △-Y or △-△, a △-Y RM transformer can almost always be paralleled with an existing Y-△ unit. In fact there is one advantage: You can ground the high side through the old unit, the low side through the new RM.

You have 20 options available:

These include: optional primary voltages—load-ratio-control—bushing current transformers—fans or provisions for future fans—junction boxes, and many others. RM (Repetitive Manufacture) power transformers are available in ratings up to 5000 kva single-phase and 10,000 kva three-phase. The ratings cover all EEI-NEMA Preferred Voltages—high and low—up to 69 kv.

Let us help you apply RM transformers. For additional information call your nearest G-E representative or write for Bulletin GEC-479. General Electric Co., Schenectady, N. Y.

401-21

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

Artist's conception of Yale Dam on the Lewis River in southwestern Washington. Construction has been started by Pacific Power & Light Co. The level area at the right is now a high promontory to be blasted to provide rock for construction

PP&L Starts Financing For Yale Hydro Project

As the initial step in financing its $26,450,000 Yale hydroelectric plant on the Lewis River in southwestern Washington, Pacific Power & Light Co. has negotiated a $13.5 million loan on 10-year unsecured bank notes. Guaranty Trust Co., New York, and other banks are making the loan at an interest rate of 3½%.

The balance needed to complete the project will be obtained through sale of common stock and bonds, Paul B. McKee, PP&L president, announced in a letter to stockholders.

President McKee explained that the short-term financing program is geared to the defense plant status of the project, which is scheduled to be rushed to completion in time to help carry defense demands during the winter of 1952-53. One great advantage to be gained through the project is that its largest output will come during the winter months, when the stream flow at the big federal plants on the Columbia is at its lowest point.

The 100,000 kw generated at Yale will double the output of PP&L's Lewis River production. The new dam will be immediately upstream from the company's 100,000-kw Merwin plant. Operation of the two plants will be co-ordinated.

Preliminary work at the project site has been under way for several weeks, with Morrison-Knudsen Co. Inc, Boise, Idaho, erecting necessary buildings and clearing land.

Design and supervision of the project are under direction of Ebasco Services Inc, New York. The dam, of rock-fill design, will rise 300 ft above the river bed. More than 3,000,000 cu ft of rock will be blasted off the top of a nearby hill to be dumped into the river for construction of the dam, which will be 1,500-ft long at the crest and 1,200-ft thick at the base. Layers of impervious material will be used to prevent seepage. The concrete spillway will have a discharge capacity of 173,000 cu ft per second.

Plans calls for an initial installation of two 50,000-kw generators, matching installation at the Merwin plant. Future development of reservoir sites on the Lewis River upstream from the Yale project, will make possible the adding of two more generators at each of the power plants.

● **Decentralization** of its business staff has been started at Phoenix by Central Arizona Light and Power Co. Five neighborhood offices will replace a central department. Each office will be staffed with a supervisor, contact clerks, a district salesman, home service adviser, and servicemen.

● **FPC** has granted a 50-year license to Lower Valley Power Light Inc. of Freedom, Wyo., for a hydroelectric project on Strawberry Creek in Lincoln County. The $620,000 development will have initial installation of two 725-hp turbines connected to 500-kw generators.

Construction Underway on Hungry Horse Switchyard

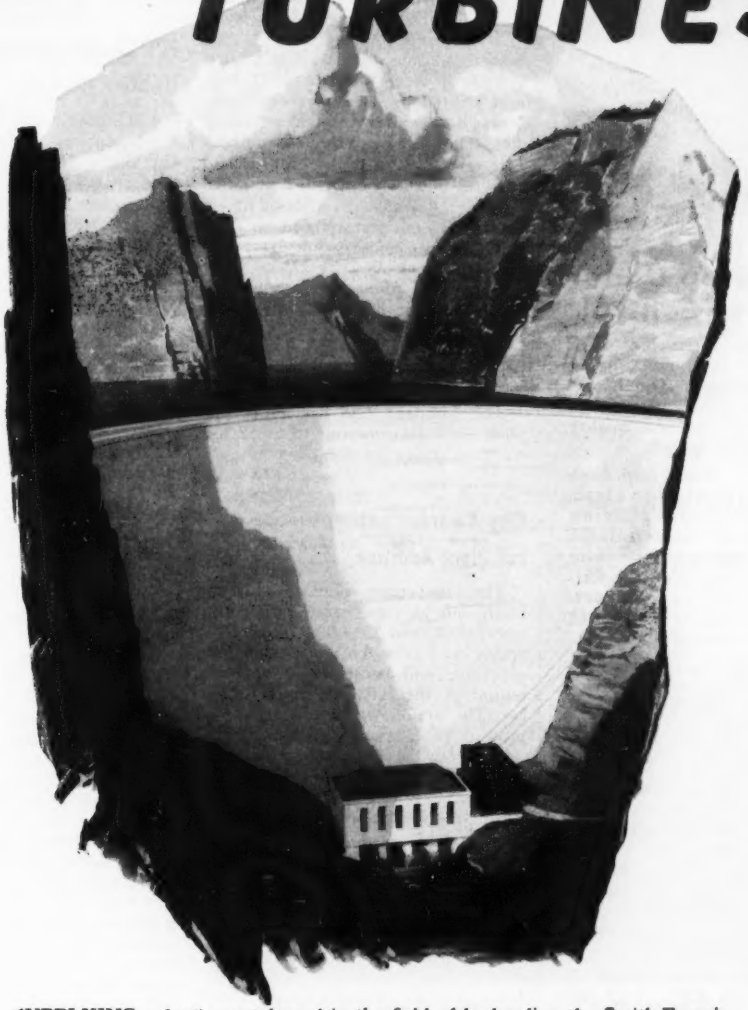
Construction has been started on Hungry Horse switchyard, eastern terminus of high-voltage transmission lines that will link the 285,000-kw power plant with other federal, municipal and private plants in the Northwest Power Pool.

The switchyard work is being handled by the Grafe-Shirley-Lane Co. of Los Angeles under a recently awarded $1,792,782 contract covering completion work on the plant. Initial work includes installation of concrete footings to support nine 68-ft high steel towers. Concrete footings will also be placed for high-voltage oil circuit breakers and a steel service building. The switchyard will be 225x165 ft and is located about 1,200 ft downstream from the power house.

● **Tacoma,** Wash., City Council has ratified a 4% salary increase for City Light Department employees. The increases were made possible by the last legislature, which passed an act allowing utilities to make one-year wage contracts above amounts previously budgeted.

● **Franklin County PUD** of Pasco, Wash., has sold a $400,000 issue of revenue bonds to William C. Harper & Sons, Seattle, on the firm's bid of 98 for an effective interest rate of 3.2914%, according to Manager Harry H. Hudlow.

FRANCIS TURBINES



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LICENSE ASKED FOR KLAMATH RIVER PLANT

Application has been filed by the California Oregon Power Co. for a Federal Power Commission license to construct its Big Bend No. 2 hydroelectric plant on the Klamath River in south central Oregon.

Specifications listed in the request include a diversion dam 52-ft high and 310-ft long, a temporary reregulating dam to provide a reservoir of 1,150 acre-ft, a conduit 16 ft in diameter and 4,440-ft long, a steel penstock, a power house one mile down stream from the diversion dam, a substation, and transmission lines.

The power house would have two remotely controlled 25,000-kw generators, each connected to a turbine with 37,000-hp capacity. Cost of the project is estimated at $8,173,880. It is part of a $50 million development planned by the company on the Klamath River.

The company had previously applied for a state permit to use 2,500 sec-ft of water for the project.

City Awards Contract For Plant Addition

The city commission of Murray, Utah, has awarded contract for the installation of a $314,000 Diesel generator to Fairbanks-Morse Co. The generator will boost the power potential of the city system by 2,200 kw. The action was taken despite a protest by a taxpayer group which stated the municipality could purchase power from the Utah Power & Light Co. for less than the generating costs of the municipal system. However, Mayor J. Clifford Hansen stated the power output of the city cost 8.45 mills per kwh in 1950, as against a price for private power of at least 8.5 mills. The system, he added, gave the city a net profit of $70,000 in 1950.

Engineers Call Bids on Lookout Point Turbines

Bids on three 52,500-hp turbines for the power house at Lookout Point Dam in Oregon were called by the Corps of Engineers for opening at Portland July 18. The first unit is to be completed by Oct. 15, 1953, the second by Feb. 15, 1954 and the third by June 15, 1954.

Lookout Point Dam, largest unit in the Willamette Basin project, is designed primarily for flood control; is expected to cost $74,800,000. Dexter Dam a few miles downstream will regulate the fluctuating discharge from operation of the turbines at the main dam and will provide an additional 15,000 kw of electric power.

FPC Denies Rehearing in Utility Rate Case

FPC has denied two applications for rehearing of its order directing California Electric Power Co. to "cease and desist" from charging rates other than those on file with the FPC for electric energy sold to the Mineral County (Nev.) power system and the U. S. Navy for its ammunition depot at Hawthorne, Nev. Applications for the rehearing were filed by the utility and the legal department of the California PUD.

The order, issued last April, finding the company's rates for energy sold to Mineral County and the Navy subject to regulation under the Federal Power Act reversed the initial decision of an FPC presiding examiner that the proceeding should be dismissed for want of jurisdiction.

The FPC found that the energy enters interstate commerce even though California Electric's transmission facilities are all located in California and those used to transmit the energy across the state line are owned by others. The commission also pointed out that, regardless of what jurisdiction the Nevada Commission may have as to Mineral County's retail rates, it has been given no jurisdiction by Nevada statutes over California Electric's charges to that county. It had not been shown, the opinion continued, that Nevada has any statutory authority to regulate the rate charged the Navy by the power company.

● **Hawaiian Electric Co.** has asked authorization to issue $3 million worth of first mortgage bonds to finance further capital expansion. Its 1951 program calls for spending $1,379,000 on its distribution plant, $470,000 on its generation plant, $234,000 in improvements and additions to general property, and $20,000 for construction on its nonutility plant. Other bond revenues will be used to replace treasury funds already spent on capital expansion.

● **Plans for construction** by Lewis County PUD of a 60-kv line from Morton to Packwood were announced recently by Merle Johnson, manager. The project will cost $325,000.

SAN JOAQUIN DEVELOPMENT PLANNED BY EDISON CO.

Southern California Edison Co. has filed application with FPC for a license for its proposed Mammoth Pool hydro project on the San Joaquin River in Fresno and Madera counties, Calif. The development would have an installed capacity of 169,000 hp; estimated cost is $39,044,800.

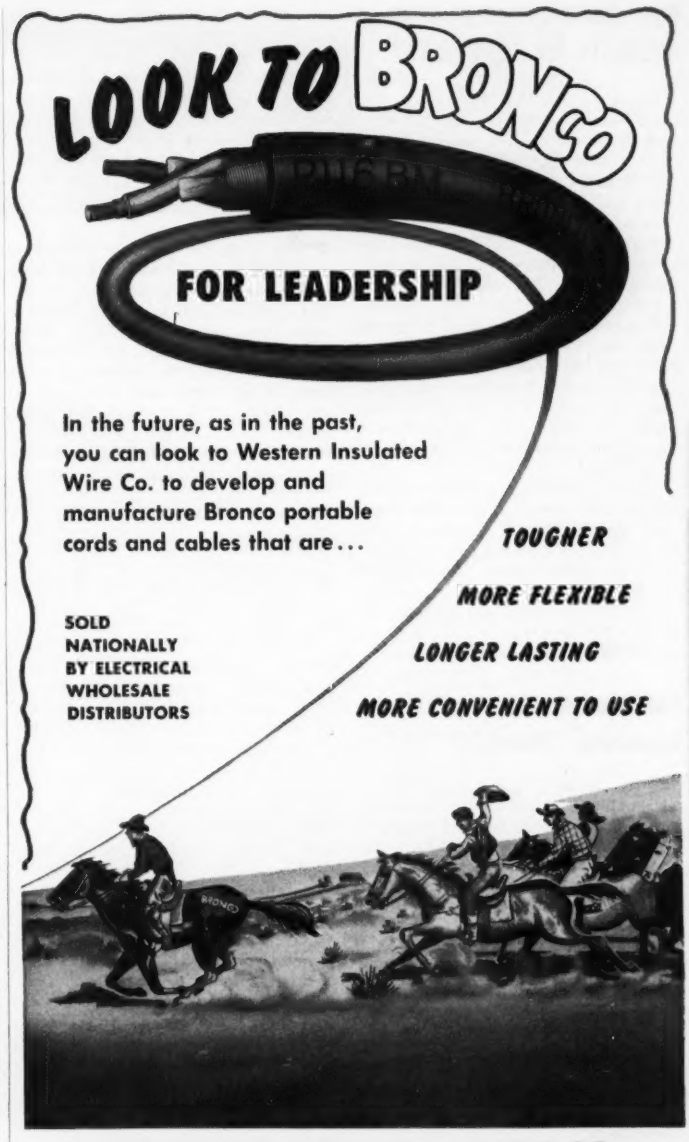
The project includes a dam having a crest length of about 980 ft and a height of about 315 ft, forming a reservoir with a gross capacity of approximately 123,000 acre-ft. There would also be two diversion dams, one about 110 ft long and 18 ft high, across Rock Creek, and the other, approximately 120 ft long and 18 ft high, across Ross Creek.

The power house would contain two 63,000-kva vertical generators having a combined capacity of 169,000 hp, each driven by an 88,000-hp turbine. The company estimates that an average of 550,000,000 kwh per year would be generated at the power house.

● **A contract** to provide a $1,300,000 city-wide street lighting program for Phoenix, Ariz., has been worked out by Central Arizona Light and Power Co. Under the terms, Calapco will handle all phases of construction and provide equipment. As the city annexes a new area, Calapco will erect adequate lights and make them part of the over-all system. The city light bill for an inadequate system now is $87,000 a year. At conclusion of the four-year system, the city light bill will be $235,000 a year. Calapco will handle all phases of operation and maintenance of the system.

● **Recently** an announcement was made by the B. C. Electric Co. at Vancouver, B.C., that it would supply men to cut down and trim trees free of charge where such trees and their branches were located near power lines, or might cause serious interruptions. The announcement was made in all three Vancouver newspapers and produced unprecedented results, the company being swamped with requests for the services of the tree surgeons.

● **A pension plan** for employees and officers of Public Service Co. of Colorado has been approved. A formula of computation works out to a $540 annual pension for employees with 20 years of service averaging $3,600 per year. A 20-year employee with $5,200 average salary would get $940 a year.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PUD COMMISSIONERS SEND REQUESTS TO CONGRESS

Charging that the Washington Water Power Co. of Spokane has been spending large sums of money spreading "misinformation about PUDs" and Grand Coulee Dam, Washington State PUD commissioners adopted a resolution at their semiannual convention in Kelso, calling upon Congress and the State of Washington to investigate the company's request for a rate increase.

Congress also was asked to reconsider its tentative action deleting funds for Ice Harbor, Albeni Falls and The Dalles dams from appropriations measure. The Hell's Canyon project in Idaho was endorsed as a means of maintaining the Northwest Power Pool.

Commissioners expressed opposition to a proposed 3½% federal energy tax on PUDs, describing taxes on all utilities—both public and private—as hidden taxes passed on to the consumer.

President Truman was asked to appoint a Northwest man for a position on the Federal Power Commission.

Farm Electrification Scholarships Offered

Two $100 farm electrification scholarships at State College of Washington for 1951-52 will be awarded by the Washington Water Power Co. This is an additional scholarship in this field over last year.

A. G. Mayer, farm department manager, said the scholarships were being offered to high school graduates who expect to enroll in electrical engineering or agriculture at WSC from nine eastern Washington counties served by WWP.

Eligibility requirements include the candidate's membership in Future Farmers of America and completion of at least two years of vocational agriculture.

Low Bidder Announced for Folsom Plant Transformers

Ferranti Electric Inc., of New York was low bidder on the manufacture and delivery of three 60,000-kva transformers for Folsom power plant, part of California's Central Valley project, according to the Bureau of Reclamation.

The firm presented a bid of $330,000, subject to a maximum price increase of 15%. Second low was Allis-Chalmers Mfg. Co. with $353,000, subject to 20% maximum increase.

Bids will be reviewed by the bureau's chief engineer before award of the contract is made. The successful bidder will be given 830 calendar days in which to deliver the first transformer, and 1,010 days for delivery of all three units.

● **The Central Station Directory,** published by McGraw-Hill Publishing Co., is being made available in the 1951 edition both in a one complete bound copy and by individual states. Demand for directories for individual states has caused the publishing company to offer the state directories to any purchaser of a complete Central Station Directory at prices ranging from $3 to $5, depending upon the length of the directory for that state. Directories for U. S. Possessions, Canada and unbound copies are also available.

● **Los Angeles** Department of Water & Power generated more than four billion kwh during the 12-month period ending in April to set a high mark in its history. William S. Peterson, assistant chief electrical engineer, reported to the board of water and power commissioners that 4,023,680,994 kwh generated during the period demonstrated that the city's load has increased three times faster than the population. From Oct. 1941 through April 1951, the city's electric load in kwh for a 12-month period more than doubled, while in the same period the population increased one-third.

● **Oregon Public Utilities Commissioner** George H. Flagg, reporting on electricity sales in the state by privately owned utilities in March, noted that the average cost per kwh for residential use was 1.347c or less than half the national average. Sales for the month to commercial customers increased 18% over March 1950, while residential consumption was up 11.1%. Flagg reported that residential and rural customers of private utilities in Oregon use three times as much electricity as the national average.

● **Tacoma City Light employees** have organized an association to represent clerical and others workers not presently represented by unions or the Civil Service League. Organization of the group springs from an act of the last Washington state legislature, which enables public utility employees to renegotiate for wages.

PUGET POWER SETS NEW DEADLINE FOR BIDS

Failing to receive satisfactory bids at a scheduled opening June 8, the Puget Sound Power & Light Co. has set Aug. 1 as the new deadline for bids on its steam heating plant at Seattle, Wash.

Frank McLaughlin, Puget Power president, said the bids received "were not in accordance with the company's conditions." He added that "an important prospective purchaser" had requested the extension to Aug. 1.

McLaughlin reiterated that the company intends to go out of the heating business next March 14, when its franchise expires.

● **Contracts** for construction of 58 miles of high-tension power line in eastern Oregon have been awarded by California-Pacific Utilities Co. to Utility Construction Co., Boise, Idaho. The power company will furnish all material for the project, with the Boise contractor handling construction phases. Included in the project is a section of the proposed loop connection with the Idaho Power Co.'s system. Most of the work centers in the John Day area.

● **California Oregon Power Co.** has been issued an amended license by FPC for its Toketee project on the North Umpqua River in Douglas County, Ore. The amendments cover addition of the proposed Slide Creek and Soda Springs developments, to be located immediately downstream from the Toketee power house. The additions will increase installed horsepower capacity of the Toketee project from 55,800 to 96,800 hp.

● **Placer County,** Calif., has applied for a preliminary FPC permit for a hydro development in El Dorado and Placer counties. Location would be the Middle Fork American River, Rubicon River and tributaries and South and North Forks of Silver Creek. Seven power houses would have an installed capacity of 346,700 kw. According to the application, power would be sold at wholesale to established distribution systems for sale in northern California.

● **S. Morgan Smith Co.** of York, Pa., holder of contracts for construction of the first eight turbines for McNary Dam across the Columbia River between the states of Washington and Oregon, is low bidder at $8,225,257 for six additional turbines.

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601-51

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● **First revision in 17 years** of the Electrical Safety Orders of California's State Department of Industrial Relations has just come off the press. Copies are available from the printing division, Documents Section, at 11th & O Sts., Sacramento 14, at $1, plus tax. The new safety orders were effective March 1, 1951, although copies were not then available from the state printing division. Work on revision of the orders has taken more than three years of hearings and committee action which sought to keep the orders as much in line as possible with the National Electrical Code. An analysis of important changes in the safety orders and differences between it and the code will be published in a future issue. These safety orders take precedence over the National Electrical Code in all wiring construction in California in occupancies where people are employed.

● **First contract** for construction of the $50,000,000 Alcoa reduction plant near Wenatchee, Wash., was awarded to Morrison-Knudsen Co. of Boise. It involved 1,000,000 cu yd of excavation, with three months allowed for completion. C. S. Thayer, in charge of Alcoa operations in the Pacific Northwest, estimated that the first potline would be ready for operation in July 1952.

A recent shipment of sixty Gardner Transformers (10 KVA, 12,000 to 120/240 volts) to Pacific Gas and Electric Company, Bakersfield, California

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NOTES ON THE TRADE

● **Standard Electric Supply Co.,** started 18 months ago by W. R. Edwards at 2nd and Gilman Sts. in Berkeley, moved recently to new and larger quarters at 689 26th St., Oakland, where 3,000 sq ft of warehouse space is stocked with wiring materials and supplies to the contracting trade only. Edwards, a former G-E Supply man, has adopted a policy of wholesale electrical supplies for electrical contractors only, no sales to industrials.

● **T. Kevin Mallen** has been elected chairman of the board of Ampex Electric Corp., San Carlos, Calif., makers of magnetic tape recorders. Mallen is also a managing partner of Ayala Corp., San Francisco.

● **Robert Bishop,** Sylvania's sales vice-president, recently visited the San Francisco and Los Angeles offices of the company, conferring with Garlan Morse, director of Pacific Coast sales. He foresaw no immediate shortage of lamps or of deliveries to the West.

● **W. A. Melchior,** formerly with the Electric Corp. at Oakland, has become a partner with **John Eichorn** at 426 Bryant St., San Francisco. The firm name has been changed to Eichorn & Melchior.

● **M. L. Fowler,** manufacturer's representative, has added the Feedrail line, a subsidiary of Russell & Stoll, to his list of accounts. He is located at 383 Brannan St., San Francisco.

● **Maxwell's Inc.** at W. 619 First Avenue, Spokane, has been named the Inland Empire distributor for Continental Radiant Glass Heat, according to Robert C. Wright.

● **Ralph C. Seiler,** formerly with Sues, Young & Brown, Los Angeles, has been made operations manager of Electrotechnic Inc., 15601 Arrow Highway, Azusa, Calif.

● **Allis-Chalmers Mfg. Co.** moved to a new location, Room 733, Subway Terminal Bldg., 417 S. Hill St., Los Angeles, recently, according to District Manager Richard Moody.

● **R. H. Fisher,** manufacturer's representative for Acro and Electro cords, has moved from 288 7th St. to 30 Harriet St., San Francisco.

● **C. C. Walker,** General Electric vice-president and construction materials department general manager, forecast continued expansion of the department's West Coast facilities, while inspecting G-E's Oakland, Calif., wire and cable plant last month. He was accompanied on his inspection trip by **B. F. Ilsley,** manager of the wire and cable division. and **G. E. Wickman,** manager of the wiring device division.

● **Victor Insulators** will be represented in the Intermountain region by the Conely Engineering Co. of Salt Lake City. Arrangements for this new representation were completed by **Ralph N. Butler,** Victor sales manager, during an extended tour of the Far West in May and June.

● **General Controls Co.** has started construction on a 24,000 sq ft, two-story addition to the engineering building at its Glendale, Calif., plant.

● **Whipple Jacobs,** president of Phelps Dodge Copper Products Corp., was in the West last month, conferring with company branch managers.

● **Reynolds Metals** Co. has opened a new San Francisco sales office at 1226 Folsom St., zone 3.

DIRECTORY ADDITIONS

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BRADLEY TOOL AND ENGINEERING, 915 Woodville St., Toledo 5, Ohio.
(Roaster-Server)
Factory service only

HALLICRAFTERS CO., THE, 4401 W. 5th Ave., Chicago 24, Ill.
(Radio & Television)
Distributors:
Los Angeles: Thomas Dist. Co., 201 S. Anderson, P.O. Box 509
San Francisco: Kaemper & Barrett Dealers Supply, 1850 Mission St.
Salt Lake City: Western Gas Appliances, 751 West 8th St., S.
Seattle: Herb E. Zobrist Co. Inc., 2121 Westlake St.
Spokane: Tubbs Electric Co., 165 S. Post St. (8)

Manufacturers' Directory

COLUMBIA STEEL CO., Russ Building, San Francisco 4, Calif.—Francis S. Howard, division vice-president, 2087 E. Slauson Ave., Los Angeles; R. H. Maddan, Jr., division vice-president, Russ Building, San Francisco; M. H. Freedman, division vice-president for Pacific Northwest with office at 1331 3rd Ave., Seattle, also 2345 N.W. Nicolai, Portland; A. C. Moore, division vice-president, Walker Bank Bldg., Salt Lake City 1.

EMPIRE CORP., 133 E. Greenfield, Milwaukee, Wis.—represented by Nourse Equipment Co., 1530 Wood Street, Oakland, Calif.; Power Generating Plants, 801 Coast Highway, Newport Beach, Calif; Graybar Electric Co. in all principal cities.

KUHLMAN ELECTRIC COMPANY, Bay City, Mich.—represented in Los Angeles, Calif. by C. P. Crowley, 117 West 9th St., Room 415; Kuhlman Electric Co., 420 Market St., San Francisco; Wm. J. Cottrell Co., 11341 S. W. Pacific Highway, Portland; Sales Engineers, Inc., 1440 11th St., Denver; Electric Supply Co., P. O. Drawer 1353, Albuquerque; Electric Products, Inc., P. O. Box 1428, 212 South 7th Ave., Phoenix; Triangle Electric Supply Co., Inc., 333 West San Antonio at Leon, P. O. Box 1731, El Paso.

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SP-15-20 For use with 15 or 20 watt lamps.
SP-30-40 For use with 30 or 40 watt lamps.
SP-85-100 For use with 100 watt lamps.

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NEWS ABOUT PEOPLE

Sorensen

● **R. W. Sorensen,** professor of electrical engineering emeritus, California Institute of Technology, has been appointed consulting engineer for the Cole Electric Co., Culver City. Professor Sorensen is a past president of the AIEE and headed up the department of electrical engineering at Cal Tech from 1910 to 1950 when he became emeritus professor. Earlier in his career he was in the transformer engineering department of General Electric Co. at Pittsfield, Mass. Professor Sorensen has served as a consultant for many of the utility and electrical manufacturing companies in southern California during his college tenure. Also he directed several projects for the Navy during both World War I and WW II.

● **William J. Hess** has recently been made chief building inspector for Sacramento County and will head up the new county ordinance work which embraces building, plumbing and electrical inspection. He expects to have four inspectors on the staff for county inspection by July, all under civil service. Sacramento County recently enacted the building ordinance covering all these fields.

● **George H. Searle,** San Francisco division electric superintendent of Pacific Gas and Electric Co. and 41-year veteran, retired last month. Searle is a native San Franciscan whose grandfather sailed his own ship around Cape Horn from England in 1850 to settle in California. He was graduated from the University of California in 1910 and joined PG and E the same year. As superintendent he has been in charge of all electric distribution operations of the company in the city. Succeeding him in the position is William P. Bedgood, electric superintendent in the company's Stockton division since 1944.

McMillan

● **F. O. McMillan,** head of the electrical engineering department at Oregon State College, Corvallis, took office as president of the AIEE last month. His election was announced at the Summer General Meeting at Toronto. Prior to appointment to the OSC faculty in 1920, McMillan was with General Electric Co. He also has been active as a consulting engineer for public utilities.

● **W. N. Farquhar,** project engineer for the new aluminum smelting plant under preliminary construction for Alcoa near Wenatchee, Wash., will manage the plant upon completion, according to **C. S. Thayer,** Alcoa's manager for Pacific Northwest operations. With the company for 25 years, he previously had been serving in the company's electric engineering department at Pittsburgh, Pa.

● **A. O. Olson,** manager and chief engineer of Hetch Hetchy Supply, Power and Utilities Engineering Bureau, City of San Francisco, will retire in December of this year after serving 25 years with the city. **Harry Lloyd,** recently appointed assistant manager of the bureau, is the presumed successor to the post of manager. Born in Sweden, Olson was graduated in electrical engineering from the Royal Technical University of Stockholm in 1912. He came to the U.S. in 1916 and worked with Great Western Power Co., Thomas Day Co. and Pacific Gas and Electric Co. before he joined the city in 1926.

● **Carl P. Jordan,** general superintendent of the Montana Power Co., retired from active service in May after 42 years in the electric industry of that state. He went to Montana in 1893, attended grade schools there, was graduated from Columbia University in 1909 in electrical engineering. He worked with predecessors to Montana Power Co. in Great Falls and Butte. He was made assistant superintendent in 1940, general superintendent in 1949.

Moffatt

● **J. J. Moffatt,** for seven years Pacific Coast district manager for the Westinghouse Electric Appliance Division, resigned recently to become general sales manager of the Free Sewing Machine Co. at Beverly Hills, Calif. Moffatt joined Westinghouse in 1927 at East Pittsburgh; was transferred to the appliance division headquarters in Mansfield, Ohio, and in 1944 was moved to the Pacific Coast. Free Sewing Machine Co. operates plants in Rockford, Ill. and Beverly Hills, Calif.

● **William C. Mullendore,** president of Southern California Edison Co., was recently named one of 14 members of the National Policy Board of the American Assembly by General Dwight Eisenhower.

● **W. G. Wehe,** who started with Graybar in San Francisco in office service in 1933, was transferred to Boise in 1946, has recently been appointed to the general department of Graybar in New York City.

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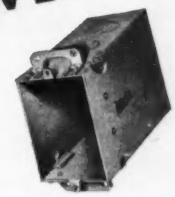

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● **E. Robert de Luccia** joined Pacific Power Light Co. in June as manager and chief engineer of the $26,450,000 Yale hydroelectric project on the Lewis River in Washington. De Luccia has been with the Federal Power Commission since 1938, served as lieutenant colonel in the Army Engineers during World War II. Since 1945 he has been chief of the FPC Bureau of Power. A 1927 graduate of Massachusetts Institute of Technology, de Luccia has also been with Stone & Webster Engineering Corp., designing hydroelectric and steam power plants in Missouri and Virginia.

● The long service of **Guy W. Faller** as Public Service Co. of Colorado executive and director ended recently with his retirement as chairman of the board. He and **Paul W. Lee,** head of the utility's general counsel firm, both asked to be relieved of their duties. Faller was general manager of P. S. of Colorado from 1934 to 1940, president from 1940 to 1943, and board chairman since that time. Lee has served as a board member since 1925. The retiring directors were replaced by **Carl A. Norgren,** president and general manager of C. A. Norgren Mfg. Co., and **William A. Bryans III,** a member of the law firm Lee, Bryans, Kelly and Stansfield, which represents Public Service in legal matters.

● **B. F. "Ben" Wiesinger,** electrical inspector for the city and county of San Francisco, retired June 30 after 27 years of service. A member of the executive council of International Assn. of Electrical Inspectors, he was the immediate past-chairman of the Northern California Chapter and plans to continue active in his association with that organization. For a short time he was temporary chief inspector after the resignation of Harold Gerber. An article by him appeared in a recent ELECTRICAL WEST.

● **Ralph Conner** has been appointed assistant to the general commercial manager of Puget Sound Power & Light Co. at Seattle, Wash. He has been with the company 22 years, most recently as supervisor in the commercial and industrial department of the central division.

● **David G. Martin,** general auditor of Pacific Gas and Electric Co. since 1927, was honored by fellow-employees on his retirement after 39 years with PG and E June 14. He is to be succeeded by **L. W. Coughlan.**

Deaths

● **C. Art Rowley,** electrical engineer well-known in southern California, died recently after a long illness. His most recent connection was that as electrical engineer for Thermador Electrical Mfg. Co., but he had engaged in consulting practice and many years ago was an electrical contractor in Pasadena. He is credited with the design for Thermador's built-in electric range.

● **Harold Q. Noack,** 50, well-known in the industry, division vice-president of Columbia Steel Co., and prior to that Los Angeles manager for Phelps-Dodge Copper Co., and prior to that with Hubbard & Co., in Oakland, was killed when his car went over an embankment near Woodside, Calif., late in May. He was son of Harry Noack, one of the pioneers of Pacific States Electric and later General Electric Supply Corp. in San Francisco.

● **Edwin F. Edsall,** division sales manager for the Pacific Northwest for Gibson Refrigerator Co., died, June 11, in Portland, where he had come in 1945. He had been with Gibson since 1936 starting with the headquarters sales staff in Greenville, Mich.

● **Henry B. Dunn,** 87, retired salesman for Puget Sound Power & Light Co., died in Seattle recently. He witnessed the first lighting of Edison's incandescent lamp as a guest of Mr. Edison.

● **Francis H. Doremus,** Rocky Mountain district manager of General Electric Co., Denver, died suddenly of heart attack, June 2, just before the Edison Electric Institute convention. He was 50 years of age and had been with General Electric Co. for many years.

● **C. A. Peace,** president and principal owner of Coast Electric Co., San Diego, died May 25. He was one of the pioneer electrical distributors in that area.

● **W. D. Howze,** manufacturer's representative well known in the Los Angeles area, died recently in Los Angeles, aged 55.

● **J. D. Garrison,** 55, head of the employment department of Southern California Edison Co. for 25 years, died June 6 in Los Angeles.

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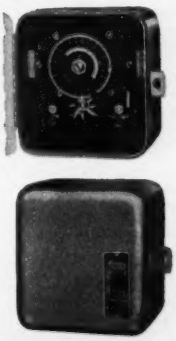

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April 1951

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(3) Directory of Appliance Service and Repair Stations.
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INDEX TO ADVERTISERS

JULY 1951

Allen-Bradley 17, 18
Allis-Chalmers Mfg. Co. 13, 19, 53, 85
All Steel Equipment, Inc. 107
Aluminum Co. of America 15
Anaconda Wire & Cable 45
Appleton Electric Co. 51

Briegel Method Tool Company 6
BullDog Electric Products 27

Clark Controller Co. 23
Classified 108
Cole Electric Co. 112

Driver-Harris Co. 31
Duncan Electric Mfg. Co. 108

Electric Equipment Co. 109
Electrical Specialty Co. 109

Federal Tele & Radio Corp. 16
Fisher-Pierce Co. 24
Fluorescent Fixtures of Calif. 30

Gardner Electric Mfg. Co. 104
General Electric Co.:
Bridgeport, Construction Materials Dept. 29
Schenectady, Apparatus Department 1, 8, 9, 35, 36, 37, 38, 97, 103, 111
General Electric Supply Corp. 14
Greenlee Tool Co. 50

Honn, George E. 94

Illinois Electric Porcelain Co. 48
Indiana Steel & Wire 105
Industrial Electronics Corp. 105
Irvington Varnish & Ins. Co. 93

Jeffries Transformer Company 94
Johns-Manville 10

Kearney Corp., James R. 41, 42, 43

Line Material Co. 3

Marcus Transformer Co. 46
McGraw-Hill Book Co. 105
Minnesota Mining & Mfg. Co. 40

New England Mica Co. 109

Ohio Brass Company 47
Ohio Carbon Co. 34

Pacific Coast Elec'l Association ..... 4th Cover
Pacific Gas and Electric Co. ..... 3rd Cover
Penn-Union Electric Corp. 49
Porcelain Insulator Corp. 39
Pyle-National Company 11

Revere Electric Mfg. Co. 94
Rodale Mfg. Co. Inc. 44
Rome Cable Corp. 20, 21

Schwager & Wood 26
Shell Oil Company 7
Sherman Mfg. Co., H. B. 108
Simplex Wire & Cable Co. 54
S. Morgan Smith Co. 99
Smoot-Holman Company 25
Southern California Edison Co. ..... 2nd Cover
Spang-Chalfant Div. National Supply Co. 89
Square D Company 12
Sunbeam Lighting Company 22

Tork Clock Co. Inc. 109
Trumbull Electric Mfg. Co. 86, 87

Victor Insulators, Inc. 91

Wagner Malleable Products Co. 100
Western Insulated Wire Co. 101
Westinghouse Electric Corp. 4, 5, 32, 33

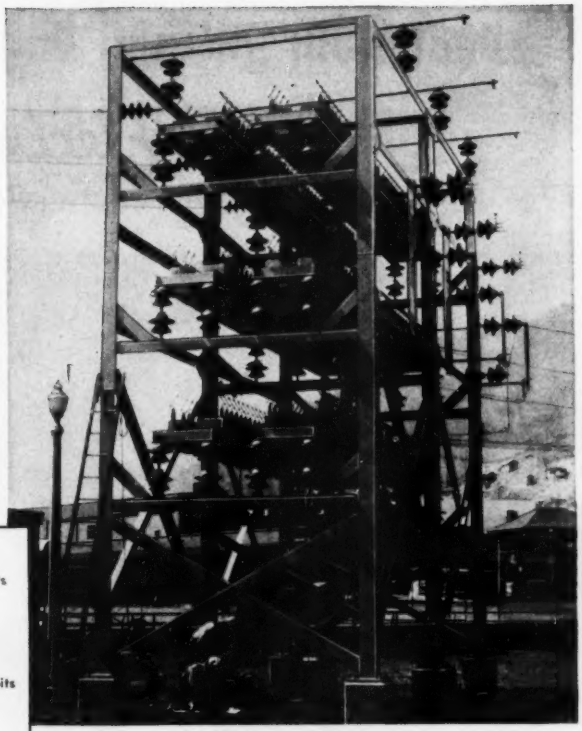
PROFILES

Leonard Stirn, Washington Water Power Co. and Personnel Section chairman, Northwest Electric Light & Power Assn., greets IBEW members attending the section's annual banquet in Spokane. From left: Victor Lindberg, Spokane; J. Scott Milne, international secretary, IBEW, Washington, D. C.; Oscar Harbak, international vice-president, ninth district, IBEW, San Francisco; Robert H. Wooden, Portland; Stirn; Floyd Smith, Seattle

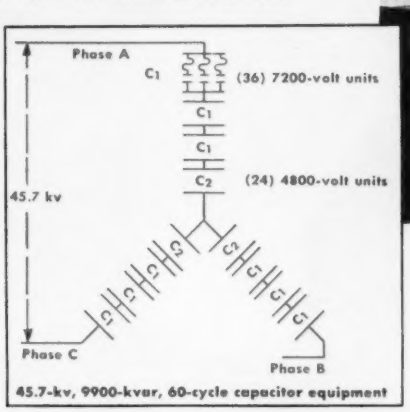
Westerners participated with electric utility lighting executives from all parts of the United States in the two-day Utility Lighting Conference, sponsored by General Electric Co. at Nela Park, Cleveland, recently. Feature of the conference was the unveiling of the new Lighting Mobilization Center in the G-E Lighting Institute. Pictured here at the dedication are: Willard Brown, manager of engineering division, G-E Lamp Department at Nela Park; John S. Walsh, Pacific Gas and Electric Co., San Francisco; B. E. Plowman, Washington Water Power Co., Spokane; Roy E. Dahlin, Southern California Edison Co., Los Angeles; Sam Hazleton, district engineer for the Pacific Sales district of the G-E Lamp Department at Oakland, Calif. These utility men among 77 attending

Capacitors now in use for 23 kv and above

Open-type equipments, for voltages up to 230 kv, consist of 25-kvar outdoor units connected in series-parallel, and mounted on insulators in galvanized-steel structures.



This 9900-kvar General Electric capacitor equipment, operating at 45.7 kv, 3-phase, has recently been installed in West Virginia. It consists of 396 individual 25-kvar outdoor capacitors, connected as shown in the diagram below.



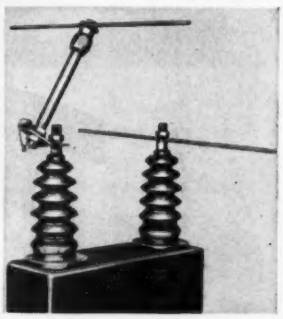
45.7-kv, 9900-kvar, 60-cycle capacitor equipment

This connection diagram applies to the capacitor equipment pictured above.

General Electric is now in a position to furnish capacitor equipments for all transmission-circuit voltages (equipments have already been furnished rated as high as 124 kv). These equipments are used on high-voltage circuits to supply bulk kilovars and thus re-enforce the sub-transmission voltages and also reduce thermal loading of substations and generators.

The capacitors used in these equipments are General Electric, outdoor 25-kvar units, rated 2400- to 7960-volts, depending on the circuit voltage. Units are connected in series-parallel to attain the desired voltage and kvar ratings. Individual bushing-mounted fuses are supplied for each unit.

For full information, get in touch with your G-E Apparatus Sales Office. General Electric Company, Schenectady 5, N. Y.



The bushing-mounted fuses, shown here and used with each capacitor in high-voltage equipments, are of the indicating type.

407-33

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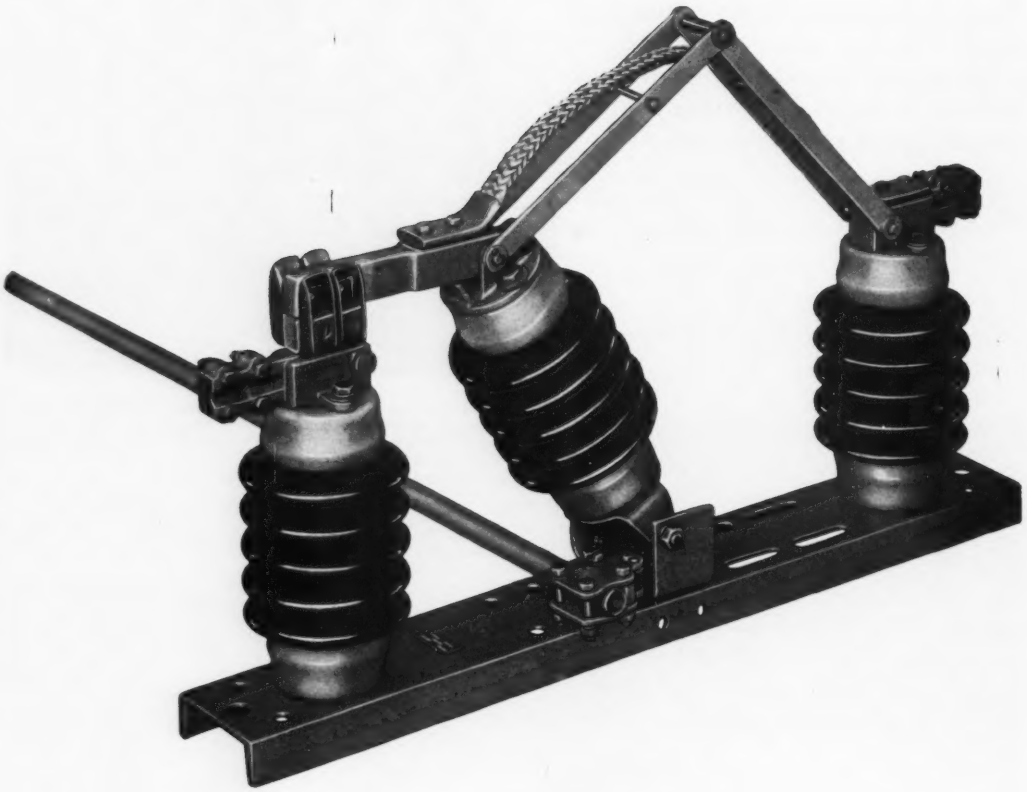

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